Operating Instructions

Video Cassette Recorder

NV-HD650 Series

G-CODE

SUPER DRIVE AI
INTELLIGENT CONTROL SYSTEM

VHS
PAL NTSC4.43

Before attempting to connect, operate or adjust this product, please read these instructions completely.

VQT5984

Dear Customer

May we take this opportunity to thank you for purchasing this Panasonic Video Cassette Recorder.

We would particularly advise that you carefully study the Operating Instructions before attempting to operate the unit and that you note the listed precautions.

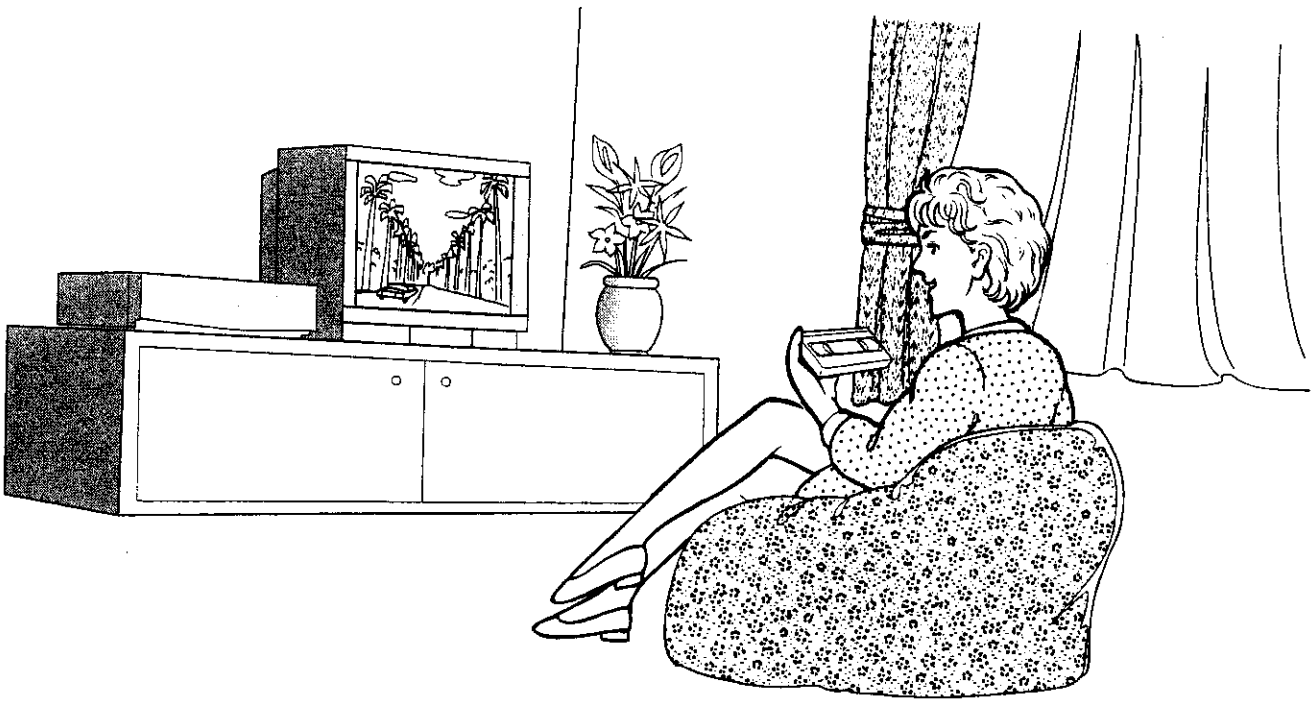
G-Code Programming System

Programming is now easier than ever: simply enter the G-Code number provided in the programme schedule column carried by newspapers and magazines.

- G-Code is a trademark applied for by Gemstar Development Corp. G-Code system is manufactured under licence from Gemstar Development Corporation.

AI Crystal View Control

AI circuit for automatic tape calibration and optimizing of playback characteristics.
During playback the contrast of tapes recorded with good level is automatically optimized.



IMPORTANT

Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

NV-HD650A: Australian model
NV-HD650EA: New Zealand model

FOR YOUR SAFETY

■ **DO NOT REMOVE OUTER COVER.**
To prevent electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

HQ (High Quality) Picture System

Video recorders carrying the HQ symbol mark feature the new VHS High Quality Picture System. This system assures complete compatibility with VTRs that use the conventional VHS system.

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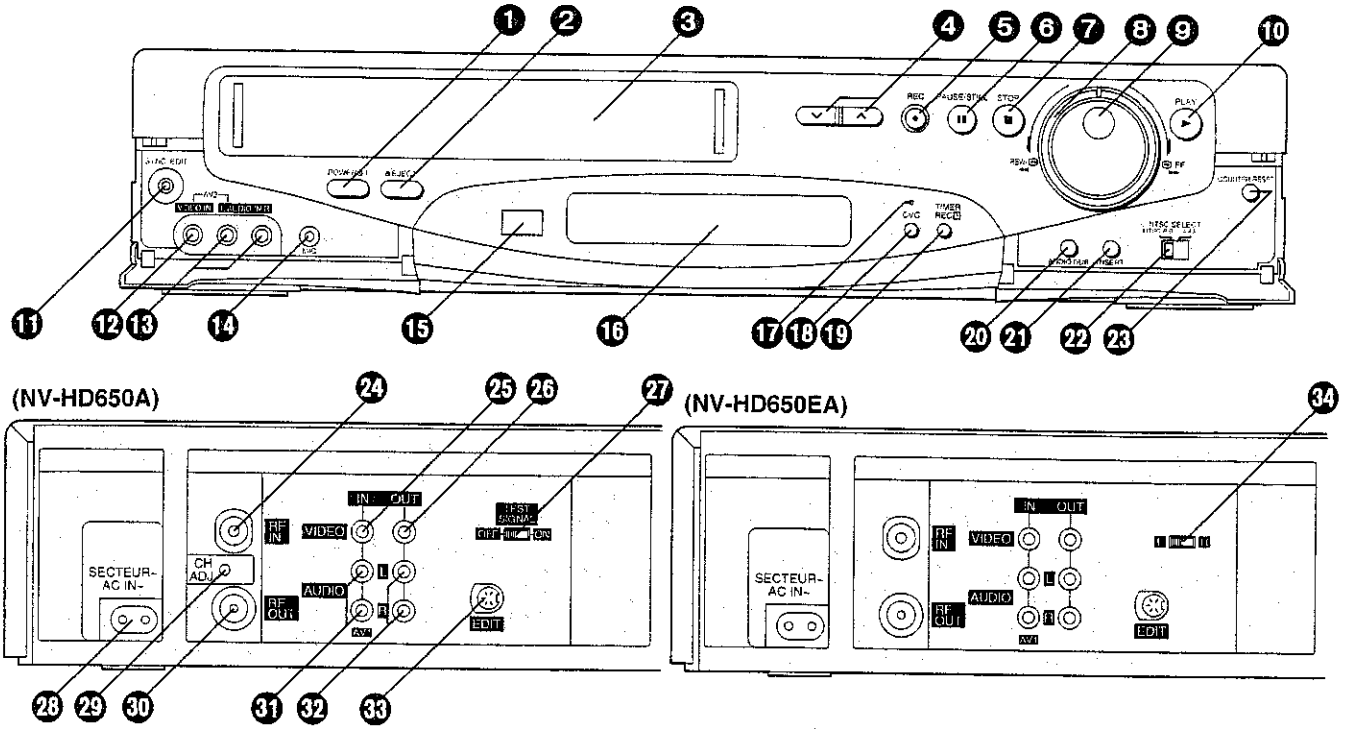
Controls and Connection Sockets

This gives a detailed explanation of the function of each button, switch and connection socket.



❶ POWER ⏻/I
Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still connected to the mains.

❷ EJECT
To eject a video cassette.

❸ Cassette Compartment
Insert a video cassette here.

❹ ∨ ∧
To select the required programme position (TV station).

❺ REC
To start a recording.

❻ PAUSE/STILL
In the stop mode: Still picture (Jog/Shuttle mode).
During playback: Still picture (Jog/Shuttle mode).
During recording: To interrupt recording.

❼ STOP
To stop any playback or recording.

❽ Shuttle Ring
In the stop mode: To rewind or fast forward the tape.
In the playback mode:
To search picture backward or forward.
In the still playback mode:
To adjust playback speed backward or forward.
In the rewind or fast forward mode:
To obtain high speed picture.

❾ Jog Dial
To locate any desired frame with utmost precision.

❿ PLAY
To start playback. "▷" is lit.
For the repeat playback function.

⓫ SYNC. EDIT
To connect a movie camera or another VTR equipped with synchronized editing capability.

⓬ VIDEO IN (AV2)
To connect the video cable to a movie camera or to another VTR.

⓭ AUDIO IN (AV2)
To connect the audio cable to a movie camera or to another VTR.

⓮ MIC
To connect a microphone for recording. Once connected, this socket has priority.

⓯ Infra-red Remote Control Receiver Window

⓰ Display

⓱ CVC Indicator
When the CVC function is on, this indicator is lit.

⑱ **CVC (Crystal View Control)**
ON: Using the CVC function, playback and recording are performed in the state which achieves optimum picture quality in light of characteristics of a tape.
- The CVC indicator is lit.
- This control should normally be left in the ON position.

OFF: Turn off the CVC function.
- The CVC indicator is not lit.
- With certain tapes, the OFF position may result in a better picture.

⑲ **TIMER REC**
To turn the timer recording function on and off.
⏲ is lit or not lit.
Once operating timer recording function, the normal VTR operation is not possible unless this button is set to off.

⑳ **AUDIO DUB**
To set up the VTR for audio dubbing.
A.DUB is appeared on screen display.

㉑ **INSERT**
To set up the VTR for insert editing.
INSERT is appeared on screen display.

㉒ **NTSC SELECT**
Set according to the colour TV system.
NTSC P.B.: When receiving PAL signals. For TV's that can only receive PAL signals.
4.43: When receiving NTSC 4.43 signals. For TV's that can receive NTSC 4.43 signals.

㉓ **COUNTER RESET**
To reset the tape counter (elapsed time) to "0:00.00".
- The tape counter is automatically reset to "0:00.00" when a video cassette is inserted.

㉔ **RF IN**
To connect to the external aerial.

㉕ **VIDEO IN (AV1)**
To connect a video cable from a Movie Camera or another video recorder.

㉖ **VIDEO OUT**
To connect a video cable to a TV or another video recorder.

㉗ **TEST SIGNAL (NV-HD650A only)**
The test signal is transmitted on channel AU37.

㉘ **AC IN~**
To connect to the main power supply.

㉙ **CH ADJ. (NV-HD650A only)**
To adjust the RF transmitting channel AU31–43.

㉚ **RF OUT**
To connect to the aerial terminal on a TV set.

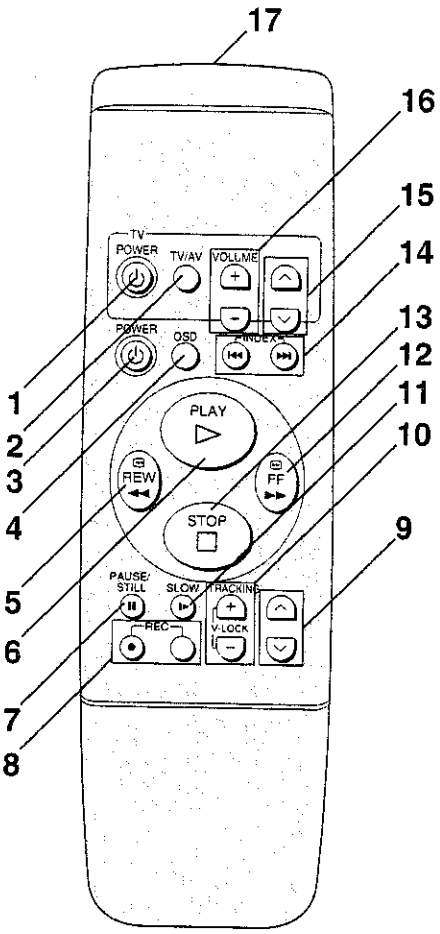
㉛ **AUDIO IN (AV1)**
To connect an audio cable from a Movie Camera or another video recorder.

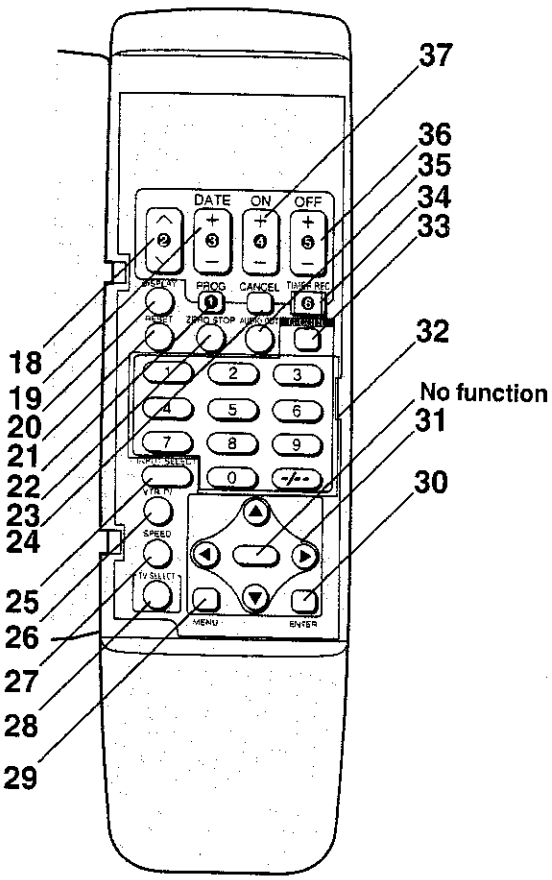
㉜ **AUDIO OUT**
To connect an audio cable to a TV or another video recorder.

㉝ **EDIT**
By connecting the optional Editing Controller (VW-EC300E/VW-EC310E) to this socket, such editing functions as Assemble Editing, Insert Editing and Audio Dubbing can be performed more quickly and efficiently between two VTRs or between a VTR and a movie camera.

㉞ **Video Playback Channel Selector (NV-HD650EA only)**
To select the video playback channel.

Infra-red Remote Controller





1 POWER (TV)
To switch the TV from on to standby mode or vice versa. In standby mode, the TV is still connected to the mains.
- With some TV models, it may only be possible to switch the TV to standby mode using this button. In this case, use **TV/AV** or ∨ ∧ **(TV)** to switch the TV on.

2 TV/AV
To select the TV input.

3 POWER (VTR)
To switch the VTR from on to standby mode or vice versa. In standby mode, the VTR is still connected to the mains.

4 OSD
For the On Screen Display Function.

5 REW (REWIND)
In the stop mode: To rewind the tape
In the playback mode: To search backward
In the rewind mode: To obtain high speed picture "◁◁" is lit.

6 PLAY
To start playback. "▷" is lit.
For the repeat playback function.

7 PAUSE/STILL
During playback: Still picture.
During recording: To interrupt recording.

8 REC
To start a recording.
- Press both buttons simultaneously.

9 ∨ ∧ (VTR)
To select the required programme position (TV station) of the VTR.

10 TRACKING/V-LOCK
For manual tracking adjustment
The + and − buttons are used to adjust the tracking when, for example, noise bars on the picture are better removed manually than by the automatic digital tracking control. After making a manual adjustment, press both buttons together to return to automatic digital tracking control.

For slow tracking adjustment
When noise bars appear during Still or Slow playback, switch over to slow playback and adjust with the + or − Button to reduce the noise bars.

For vertical locking adjustment
Use the + and − buttons to minimize any vertical jitter during still-picture playback.

11 SLOW
For the slow motion playback function. "▯▷" is lit.

12 FF (FAST FORWARD)
In the stop mode: To fast forward the tape
In the playback mode: To search forward
In the fast forward mode: To obtain high speed picture "▷▷" is lit.

13 STOP
To stop any playback or recording.

14 INDEX
For the index search function.

15 ∨ ∧ (TV)
To select the required programme position (TV station) of the TV.

16 VOLUME
To adjust the volume of the TV.

17 Infra-red Transmitter

18 ∨ ∧
To programme a timer recording.

19 DATE
To programme a timer recording.

20 DISPLAY
To change the indication on the VTR Display.

→Clock→Counter→Remaining Tape Time

21 RESET
To reset the tape counter (elapsed time) to "0:00.00".
- The tape counter is automatically reset to "0:00.00" when a video cassette is inserted.

22 PROG
To set and check timer programmes.

23 ZERO STOP
For the zero stop function.

24 CANCEL
To cancel the settings made for a timer recording.

25 INPUT SELECT
To select the A1 or A2 external recording source.

26 VTR/TV
To select the VTR mode or TV mode.
(NV-HD650A: No function.)

27 SPEED
To select the tape speed desired for recording.
SP gives the best picture quality.
LP gives the longest recording time.

28 TV SELECT
To set the remote controller for operation of the TV.

29 MENU
To make OSD menu appear on the TV screen.

30 ENTER
To confirm the selection, or to store.

31 ▲ ▼ ◀ ▶
To make selections from On Screen Display.

32 Programme Position Selector Buttons
- To select the programme positions (1–99).

9: (9)

19: (-/--) → (1) → (9)

- To programme a G-Code number.

33 G-Code
For the G-Code programming.

34 TIMER REC
To turn the timer recording function on and off.
◳ is lit or not lit.
Once operating timer recording function, the normal VTR operation is not possible unless this button is set to off.

35 AUDIO OUT
To select the desired sound mode.
At the every push of this button, the audio output mode changes as follows.

→Stereo→Left→Right→Normal audio track→

The Left (L) and Right (R) Indicators show which sound mode is selected in the following way.

Stereo: Both the Left (L) and Right (R) Indicators appear.
Left: The Left (L) Indicator appears.
Right: The Right (R) Indicator appears.
Normal: Both the Left (L) and Right (R) Indicators don't appear.

36 OFF
To programme a timer recording.

37 ON
To programme a timer recording.

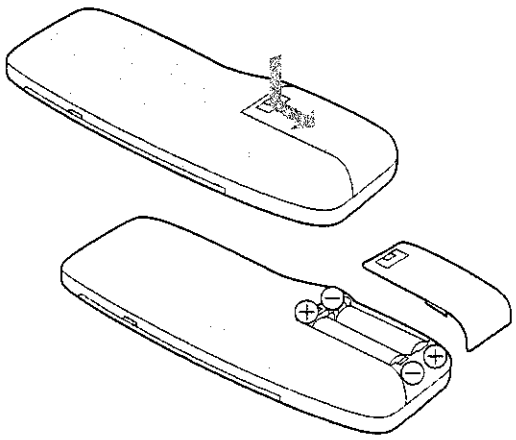
Power Source for the Remote Controller

The remote controller is powered by 2 "AA", "UM3" or "R6" size batteries. The life of the batteries is about one year, although this depends on the frequency of use.

Precautions for Battery Replacement

- Load the new batteries with their polarity (⊕ and ⊖) aligned correctly.
- Do not apply heat to the batteries, or an internal short-circuit may occur.
- If you do not intend to use the remote controller for a long period of time, remove the batteries and store them in a cool and dry place.
- Remove spent batteries immediately and dispose of them.
- Do not use an old and a new battery together, and never use an alkaline battery with a manganese battery.

Installing the Batteries

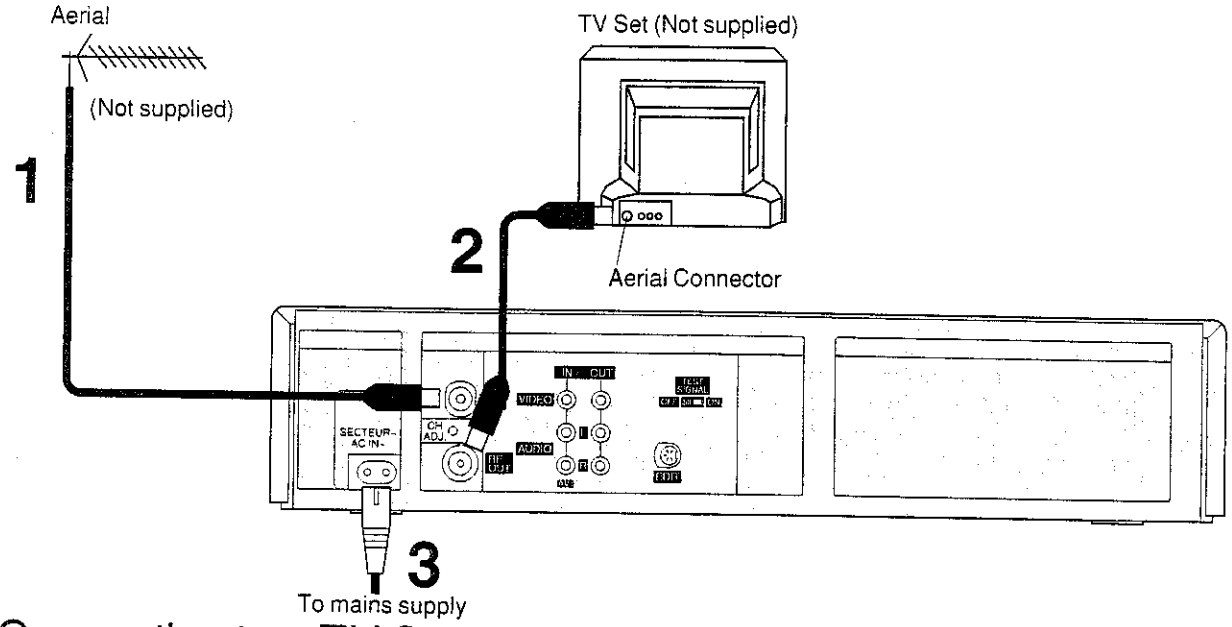


Connections

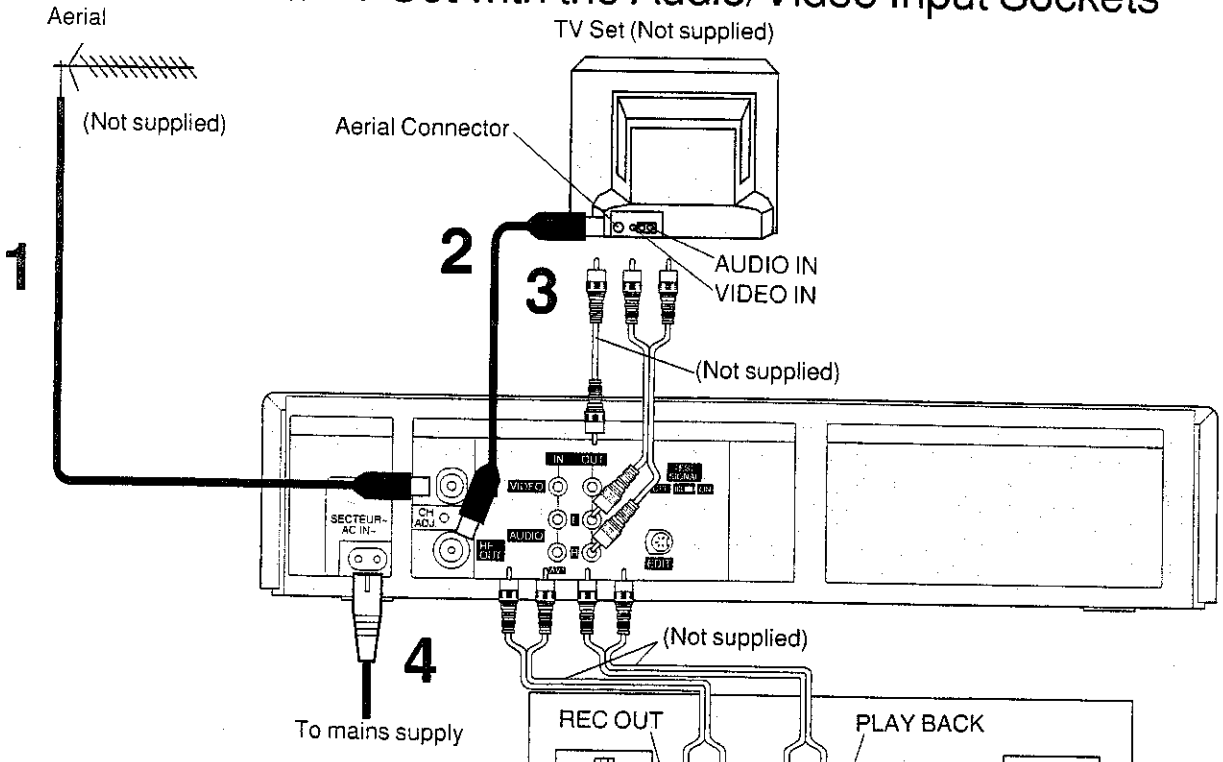
This tells you how to connect with an aerial, TV, etc.

Basic Connections

The following connections are required to record and play back the VTR through TV set:



Connection to a TV Set with the Audio/Video Input Sockets

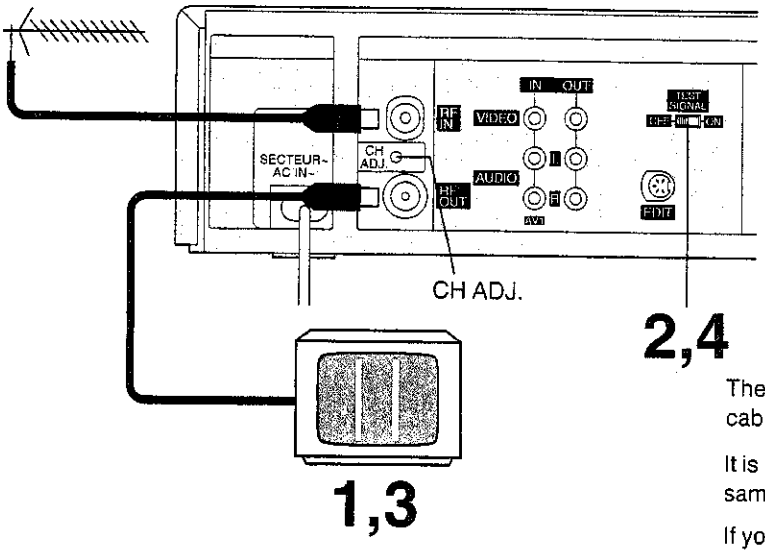


Note:
To obtain stereo performance when playing stereo, Hi-Fi tapes it is necessary to make connections as shown above.

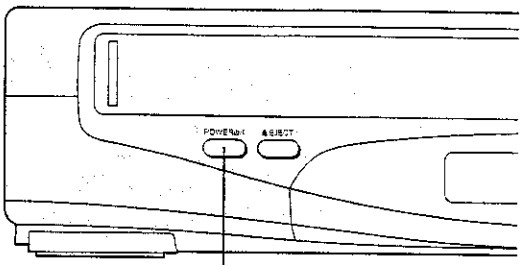
•Connection to a Stereo Amplifier

Tuning the TV to your VTR

NV-HD650A



1,3



2,4

1

The VTR supplies a signal to the TV set via the RF coaxial cable on channel AU37.

It is possible to view the video picture on your TV in the same way that you watch TV broadcasts.

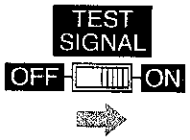
If you have connected the VTR to the TV through the video and audio sockets then you do not need to follow the procedure mentioned below.

Operations

1

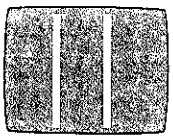
Turn on the TV and VTR.

2



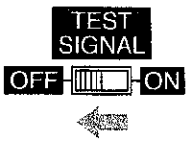
To generate a test pattern, set **TEST SIGNAL** to ON.

3



Set the TV to an unused position which you wish to use for your video playback.

4

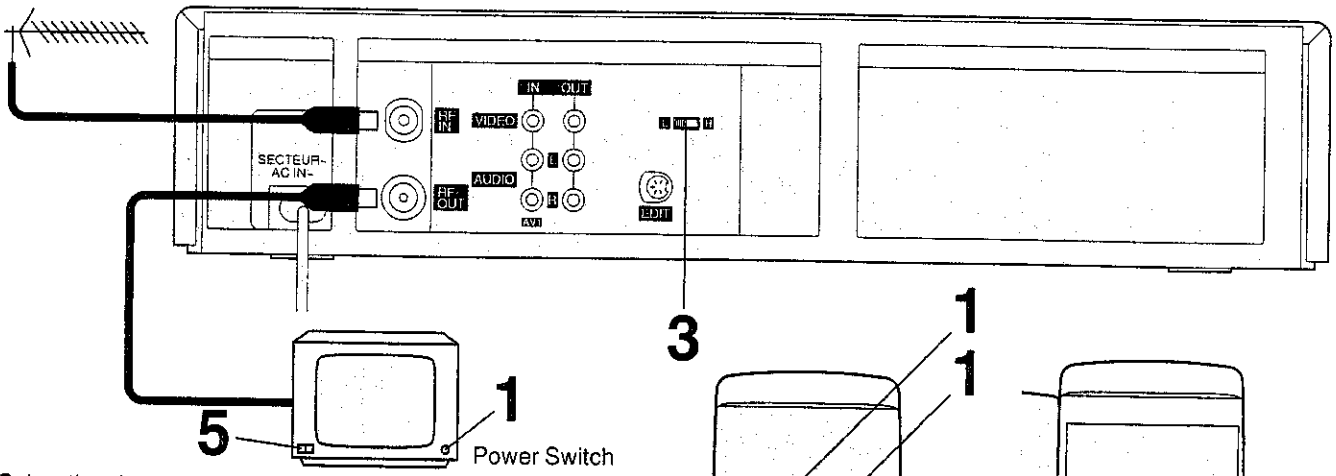


Set **TEST SIGNAL** to OFF.

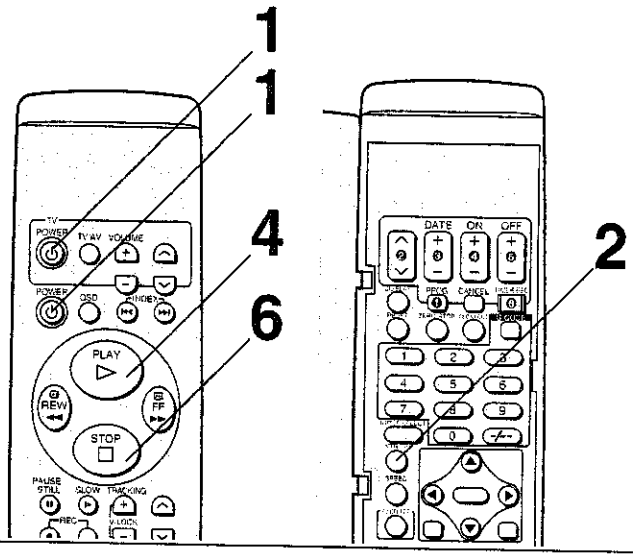
Note:
The test signal is transmitted on video channel AU37. If you are encountering interference from a TV broadcast on this video channel, you may readjust to another free channel (AU31–43) by using the **CH ADJ.** screw which is located on the rear of the VTR.

Please note that if the **CH ADJ.** screw is used then you will have to retune your TV to the test signal as in item **2** to **4** above.

NV-HD650EA



Select the channel or AV.



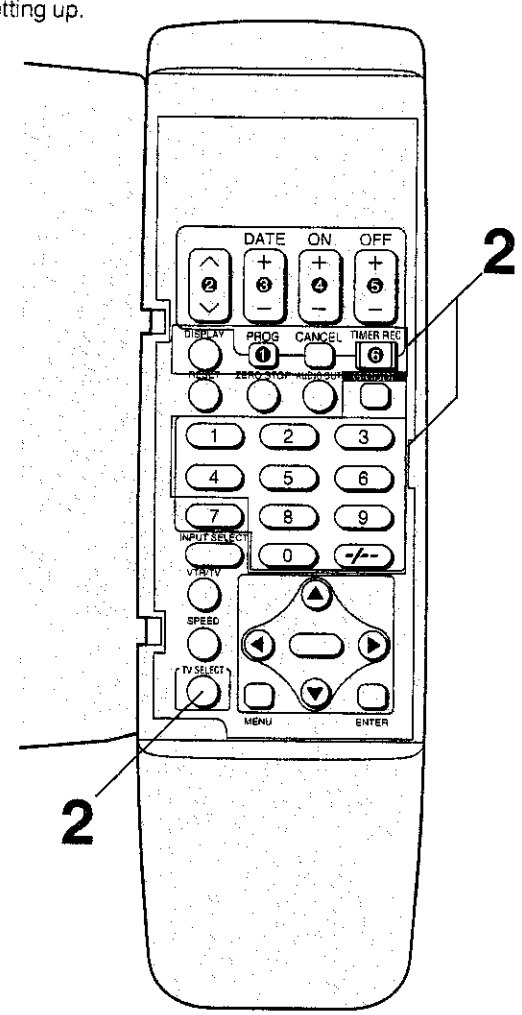
It is possible to view the video picture on your TV in the same way that you watch TV broadcasts.

If you have connected the VTR to the TV through the video and audio input sockets then you do not need to follow the procedure mentioned below. Instead, simply select AV mode on the television.

Operations	Display Symbol	
1	TV POWER, POWER	Turn on the TV and VTR.
2	VTR/TV	Select the VTR mode.
3	L H	Select the video playback channel which is not occupied with any TV station. H: Channel 3 L: Channel 2
4	PLAY	Insert a **pre-recorded** cassette tape and press **PLAY**.
5		Select a programme number on the TV set which you wish to use as the video viewing channel. Then tune in the TV to the picture from the cassette tape currently playing.
6	STOP	Stop the playback.

Setting the Remote Controller for Operation of your TV

You can operate some manufacturer of TVs (see following table) using the supplied Remote Controller after this setting up.



Preparation

Install the batteries in the remote controller. See page 7.

Operations

1 Turn on the TV.

2 Press corresponding operation button to your TV manufacturer (see following table) while keeping **TV SELECT** pressed.

- **If setting is correct, TV will be turned off automatically.**

TV Manufacturer	Operation Button
Panasonic/National	TV SELECT + DISPLAY
	TV SELECT + PROG ❶
	TV SELECT + CANCEL
	TV SELECT + TIMER REC ❻
SONY	TV SELECT + 1
TOSHIBA	TV SELECT + 2
JVC	TV SELECT + 3
HITACHI	TV SELECT + 4
MITSUBISHI	TV SELECT + 5
	TV SELECT + 6
SHARP	TV SELECT + 8
PHILIPS	TV SELECT + 9
NEC	TV SELECT + 0
SANYO	TV SELECT + -/--

When the TV manufacturer is Panasonic/National or MITSUBISHI:

When the TV's power is turned off in step **2** above, turn it back on and adjust the TV's volume using this remote controller. The volume can be adjusted if the operation button matches the manufacturer of TV.

If it is not possible to adjust the TV's volume, try pressing the other operation button to match the manufacturer of TV again until the volume can be adjusted.

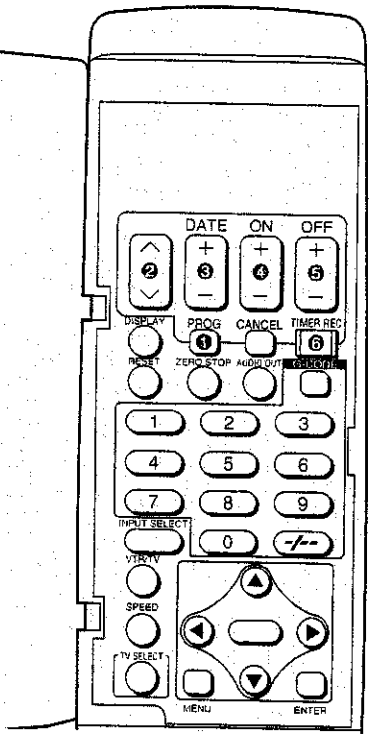
Note:

Some TV models cannot be operated using this remote controller.

Language Setting of On Screen Display

Preparations

- Confirm that the TV is on and the VTR viewing channel is selected.
- Turn on the VTR.
- Press **VTR/TV** to select the VTR mode. (NV-HD650EA only)

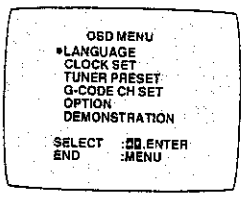


To select the Desired Language

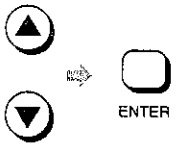
Select one of the two languages displayed: English and Russian.

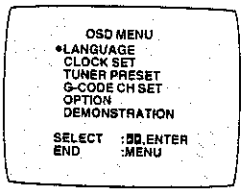
1 Press **MENU**.

On Screen Display

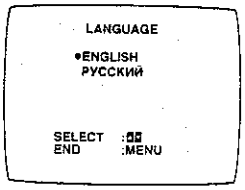


2 Select **LANGUAGE**.





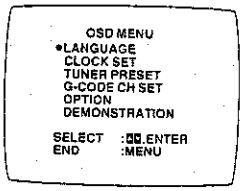
3 Select the desired language.



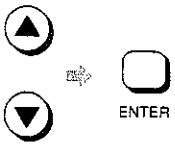
4 Press **MENU** twice.

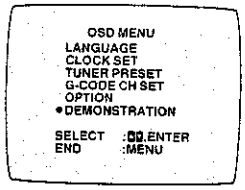
To View a Demonstration

1 Press **MENU**.



2 Select **DEMONSTRATION**.





- During Demonstration mode, all the On Screen Displays are displayed one after the other at about five second intervals.

3 Press **MENU** to stop the Demonstration.

Note:

The Menu Screen has a blue background. However, if there is no signal input during AV1/AV2 is selected, the Menu Screen may change to black and white when **MENU** is pressed. This does not indicate a malfunction.
If this happens, either input a signal or select other programme position.

Setting the Clock of the VTR

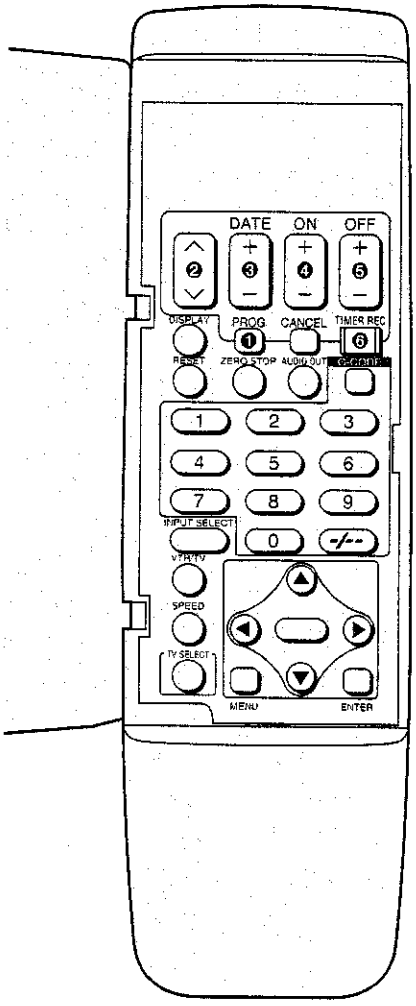
The built-in clock is used to activate the timer for automatic recording and must be set to the correct time.

The built-in digital clock employs the 24-hour system.

For Example:
Date; 16th, October, 1999
Time; 20:15

Preparation

- Confirm that the TV is on and the VTR viewing channel is selected.
- Turn on the VTR.
- Press **VTR/TV** to select the VTR mode. (NV-HD650EA only)



Time Reset Function

If the clock is less than two minutes slow or fast, it can easily be reset to the proper time.

For example:
Resetting the clock to 12:00.00.

1 Select **CLOCK SET** from OSD menu and press **ENTER**.

2 When the current clock display on the VTR is between 11:58 to 12:01, press **MENU** as soon as you hear the 12:00.00 time signal. This resets the time to 12:00.00.

Operations	On Screen Display
1 MENU	Press **MENU**.
2 ▲ ▼ ENTER	Select **CLOCK SET**.
3 Set each item by pressing ▲ or ▼ and ▶.	
	Set **Year** "1999".
▲ ▼	Set **Month** "10".
▶	Set **Date** "16".
	Set **Time** "20:15". • When it is kept pressed, the indication changes in 30-minute steps. • There is no need to press ▶.
4 MENU	Display Symbol Press **MENU**. • The clock will start.

OSD MENU
•LANGUAGE
CLOCK SET
TUNER PRESET
G-CODE CH SET
OPTION
DEMONSTRATION
SELECT :▪▪,ENTER
END :MENU

OSD MENU
LANGUAGE
•CLOCK SET
TUNER PRESET
G-CODE CH SET
OPTION
DEMONSTRATION
SELECT :▪▪,ENTER
END :MENU

CLOCK SET
Y M D H:M
1999 1 1 0:00
SELECT: ▪▪ –/+:▪▪
START:MENU

CLOCK SET
Y M D H:M
1999 10 1 0:00
SELECT: ▪▪ –/+:▪▪
START:MENU

CLOCK SET
Y M D H:M
1999 10 16 0:00
SELECT: ▪▪ –/+:▪▪
START:MENU

CLOCK SET
Y M D H:M
1999 10 16 20:15
SELECT: ▪▪ –/+:▪▪
START:MENU

Note:
The clock operates for at least 60 minutes by its backup system in the event of power failure.

Storing TV Broadcasts into your VTR

Introduction

The VTR is fitted with its own tuner (just like a normal TV set) and can be pre-set to receive up to 99 TV broadcast stations.

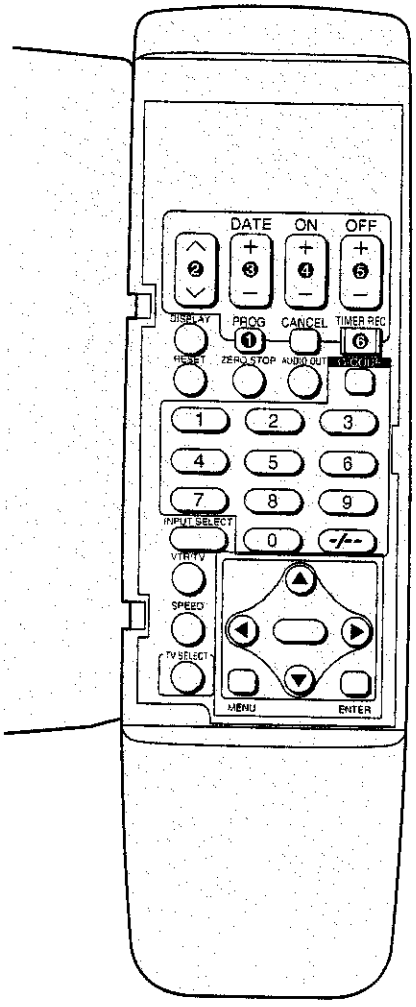
Preparations

- Confirm that the TV is on and the VTR viewing channel is selected.
- Turn on the VTR and select the programme position except A1 or A2.
- Press **VTR/TV** to select the VTR mode. (NV-HD650EA only)

PRE-PROGRAMMED TV CHANNELS (NV-HD650A)

The local TV transmission channels 2, 7, 9, 10 and 28 are factory-preset in this VTR. That is, if you can receive television broadcasts on VHF channels 2, 7, 9, 10 and on UHF channel 28, these are already tuned on the programme positions with the matching numbers.
However, it is possible to cancel these presettings and tune the local TV broadcast channels on any desired programme positions.
For alternative settings and tuning of additional TV broadcasts channels, follow the Tuning Operations.

Auto Tuning Procedure



Operations	On Screen Display	
1 MENU	OSD MENU •LANGUAGE CLOCK SET TUNER PRESET G-CODE CH SET OPTION DEMONSTRATION SELECT :▯▯,ENTER END :MENU	Press **MENU**.
2 ▲ ▼ ENTER	OSD MENU LANGUAGE CLOCK SET •TUNER PRESET G-CODE CH SET OPTION DEMONSTRATION SELECT :▯▯,ENTER END :MENU	Select **TUNER PRESET**.
3 ▲ ▼ ◀ ▶	CH 1 CLEAR..... •AUTO TUNE• SEARCH''' FINE ON •OFF 1 SELECT:▯▯ -/+:▯▯ END: MENU	Select **AUTO TUNE** and press ◀ or ▶. •When the Auto Tuning finished, On Screen Display disappears and programme position 1 is selected.
	CH 1 SEARCH END: MENU	

Notes:

- The Auto Tuning is searching for TV station from VHF minimum to UHF maximum and memorizing the data for every programme position. The other programme positions are skipped.
- The Auto Tuning takes seven or more minutes to complete the search.
- If VTR is not correctly tuned by Auto Tuning, follow the procedure on next page.

Manual Tuning Procedure

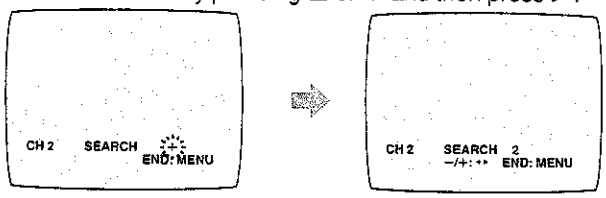
1 Press **MENU**.

2 Select **TUNER PRESET** by pressing ▲ or ▼ and **ENTER**.

3 Select **CH** by pressing ▲ or ▼ and then select the programme position by pressing ◄ or ►.

4 Confirm that **CLEAR** is set to **OFF**.

5 Select **SEARCH** by pressing ▲ or ▼ and then press ►.



- If the desired TV station is not be tuned, press ► again.
- Press **MENU** and repeat steps **3–5** for each programme position you want to tune to a station.

6 Press **MENU** three times.

Channel Plan

	VHF	UHF
NV-HD650A	0–12	21–69
NV-HD650EA	1–11	21–69

NV-HD650A:

Broadcast TV Channel	Position tuned on VTR
2 ABC	2
7 ATN	7
9 TCN	9
10 TEN	10
28 SBS	28

This table will be required when programming the G-Code.

Fine Tuning Procedure

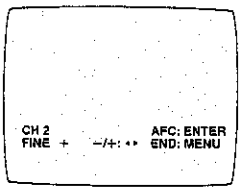
1 Press **MENU**.

2 Select **TUNER PRESET** by pressing ▲ or ▼ and **ENTER**.

3 Select **CH** by pressing ▲ or ▼ and then select the programme position by pressing ◄ or ►.

4 Select **FINE** by pressing ▲ or ▼.

5 Press ◄ or ► to obtain the best tuning condition.



- To return the tuning to its former state, press **ENTER**.

6 Press **MENU**.

Blanking of Unoccupied Programme positions

1 Press **MENU**.

2 Select **TUNER PRESET** by pressing ▲ or ▼ and **ENTER**.

3 Select **CH** by pressing ▲ or ▼ and then select the programme position by pressing ◄ or ►.

4 Select **CLEAR** by pressing ▲ or ▼.

5 Select **ON** by pressing ◄ or ►.
- Repeat steps **3–5** for another unoccupied programme positions to skip during the selection of the programme positions.
- To cancel the blanking of a programme position, select that programme position and then select **CLEAR OFF**.

6 Press **MENU** twice.

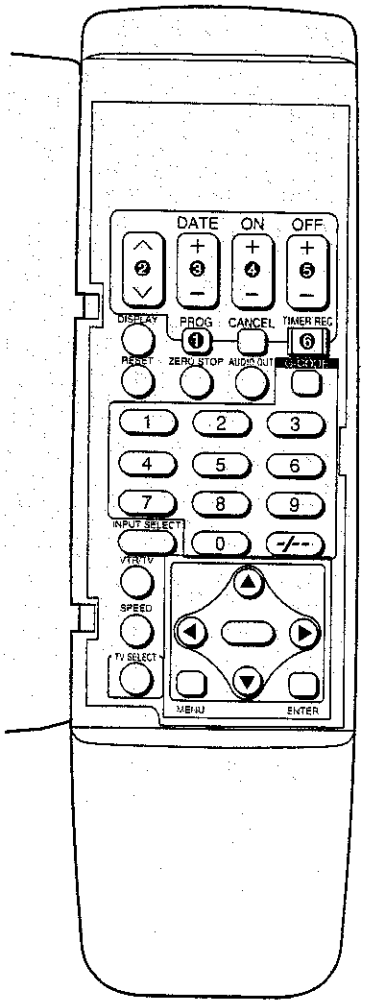
Preparations for G-Code Programming

Identification numbers must be set for G-Code programming. Simply proceed with the G-Code programming operation described on page 26, and the identification numbers of the TV stations concerned will be set automatically. This means that G-Code programming is possible even without performing the operation described on this page. However, you can follow the setting procedure described below if you wish to set the identification numbers of all the TV stations prior to actual programming.

"Identification numbers" refer to the numbers used for identifying the TV stations.
The programme positions on the VTR receiving the TV stations are set in these identification numbers.
Have a newspaper or magazine on hand which lists today's local TV station programmes and G-Code numbers.

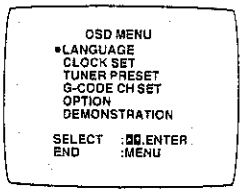
Preparations

- Set the clock of the VTR. See page 13.
- Store TV broadcasts into your VTR. See pages 14 and 15.
- Confirm that the TV is on and the VTR viewing channel is selected.
- Turn on the VTR.
- Press **VTR/TV** to select the VTR mode. (NV-HD650EA only)

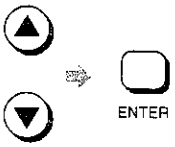


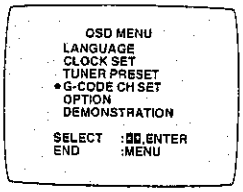
Operations	On Screen Display

1 Press **MENU**.

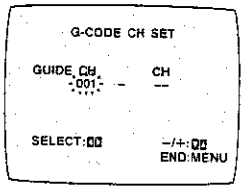


2 Select **G-CODE CH SET**.

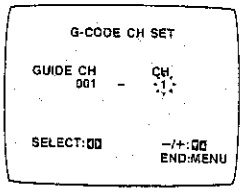




3 Select the identification number (Guide Channel) (001–255).



4 Press ◀ or ▶ and then select the programme position (1–99, A1, A2).



- To set the other TV stations, press ◀ or ▶ and then repeat steps **3** and **4**.

5 Press **MENU** twice.

Note:
To receive satellite stations, the satellite receiver must be connected to the VTR and programme position must be set depending on the type of the connection mode.
A1/A2: When the satellite receiver is connected to the Audio/Video input sockets (AV1/AV2).
- When the satellite receiver is connected by means of the RF coaxial cable, set to a free programme position between 1 and 99.

For Example:
(NV-HD650A)

TV Station	Programme Position on VTR	Guide Channel
ABC	2	002
ATN	7	007
TCN	9	009
TEN	10	010
SBS	28	028/001

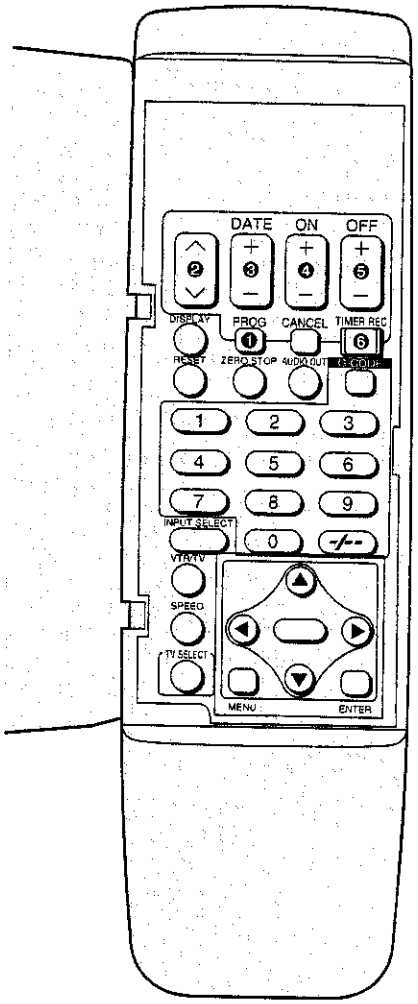
For Example:
(NV-HD650EA)

TV Station	Programme Position on VTR	Guide Channel
TV ONE	1	001
CHANNEL 2	2	002
TV3	3	003
SKY TV MOVIES	4	004
SKY TV SPORTS	5	005
SKY TV NEWS	6	006
SKY ORANGE	7	007
SKY DISCOVERY & TRACKSIDE	8	008
CTV	11	011

Settings Using On Screen Display

Preparations

- Confirm that the TV is on and the VTR viewing channel is selected.
- Turn on the VTR.
- Press **VTR/TV** to select the VTR mode. (NV-HD650EA only)



To select the corresponding Cassette Tape Length for displaying the approximate remaining tape time

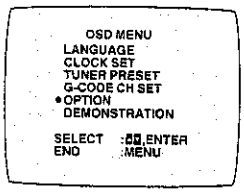
1 Press **MENU**.

MENU

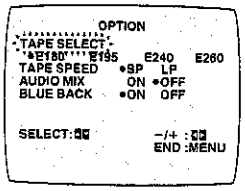
2 Select **OPTION**.

On Screen Display

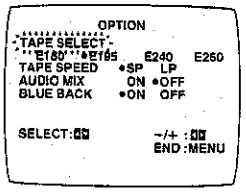
ENTER



3 Select **TAPE SELECT**.



4 Select the corresponding cassette tape length.

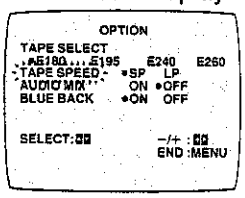


E180: For E30, -60, -90, -120, -150 and -180 tapes
E195: For E195 tape
E240: For E240 tape
E260: For E260 and -300 tapes

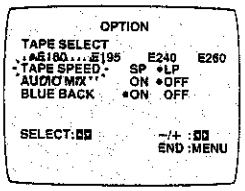
To select the Desired Tape Speed for the manual recording

1 Select **TAPE SPEED**.

On Screen Display

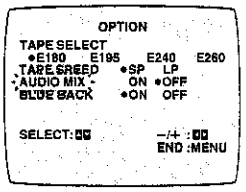


2 Select the desired tape speed.

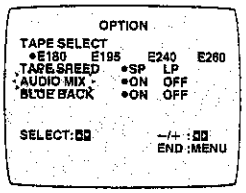


Audio Mix

1 Select **Audio Mix**.



2 Select **ON** or **OFF**.



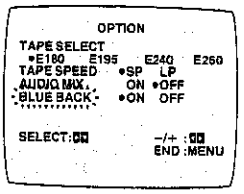
ON: Both sound tracks (the Hi-Fi sound track and the normal sound track) are played back mixed together. Use this setting when playing back a cassette tape which has been insert edited or audio dubbed.

OFF: Normally set at this position to reproduce the better sound available from the Hi-Fi track.

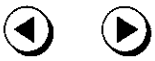
For Blue Background Function

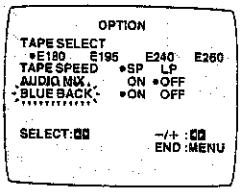
When **BLUE BACK** is **ON**, the screen will always have a blue background when no signal is received or the received signal is very weak.

1 Select **BLUE BACK**.



2 Select **ON**.

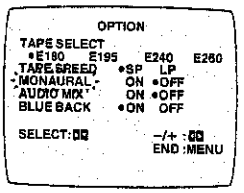




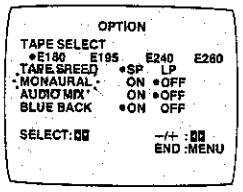
- When **BLUE BACK** is **OFF**, the blue background function does not work.
- It is not possible to record the blue picture of the blue background function.

To select the Sound Mode (NV-HD650EA only)

1 Select **MONAURAL**.



2 Select **OFF**.



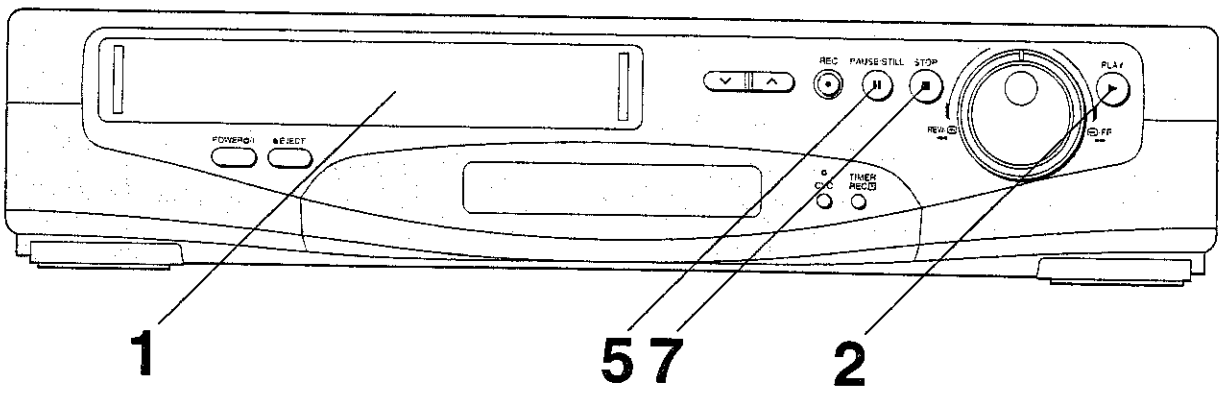
- Select **ON** to record the normal sound during a NICAM broadcast or if the stereo sound is distorted due to inferior reception conditions.

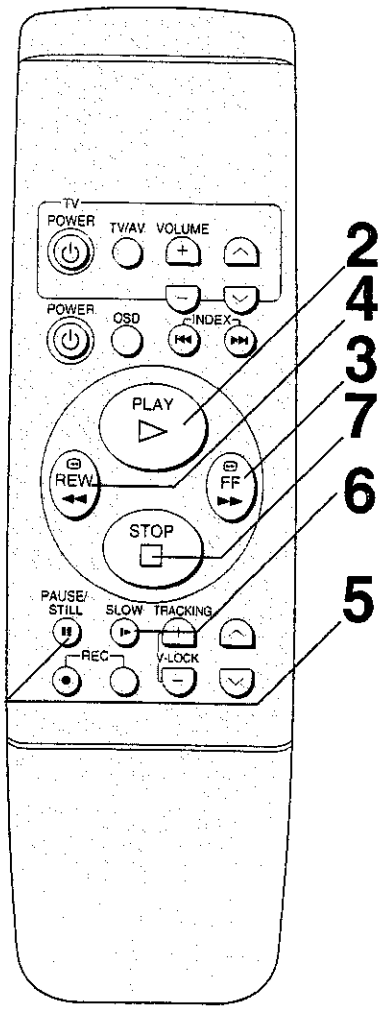
After All Settings are selected

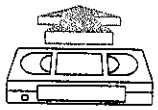
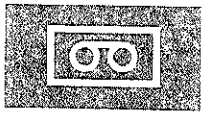
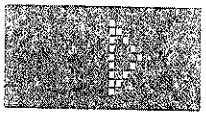
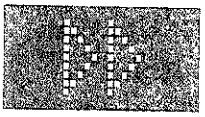
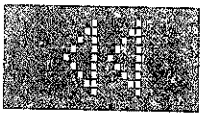
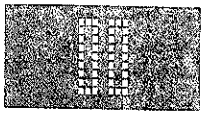
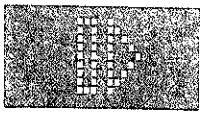
Press **MENU** twice to make On Screen Display disappear.

MENU

Playback





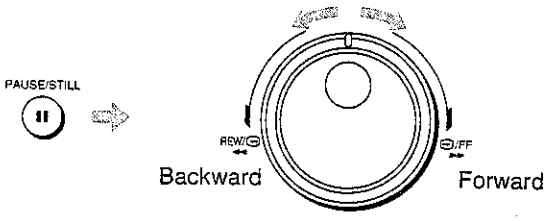
Operations	Display Symbols	
1 		Insert a recorded cassette tape.
2 PLAY ▷		Start viewing the picture.
3 → FF ▶▶		Search forward by tapping **FF**. ●To change back to normal playback, press **PLAY**.
4 → REW ◀◀		Search backward by tapping **REW**. ●To change back to normal playback, press **PLAY**.
5 → PAUSE/ STILL ⏸		View a still picture. ●To continue the normal playback, press **PLAY** or **PAUSE/STILL**.
6 → SLOW		View the slow motion picture. ●To continue the normal playback, press **PLAY**.
7 STOP □		Stop viewing the picture.

Other Playback Functions

To change the Playback Speed

1 Press **PAUSE/STILL** on the VTR.

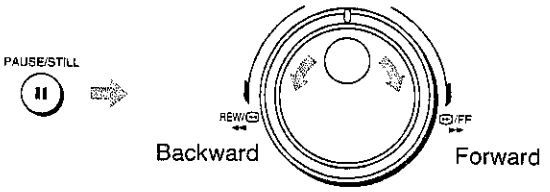
2 Rotate Shuttle Ring.



To locate the Desired Picture Exactly

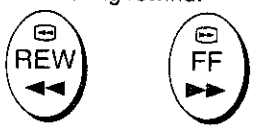
1 Press **PAUSE/STILL** on the VTR.

2 Turn Jog Dial.



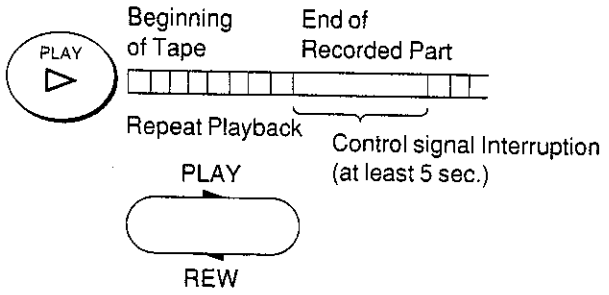
To obtain High Speed Picture During Fast Forward or Rewind

Keep **FF** pressed during fast forward.
Keep **REW** pressed during rewind.



To playback the Recorded Part Repeatedly

Keep **PLAY** pressed for more than 5 seconds.

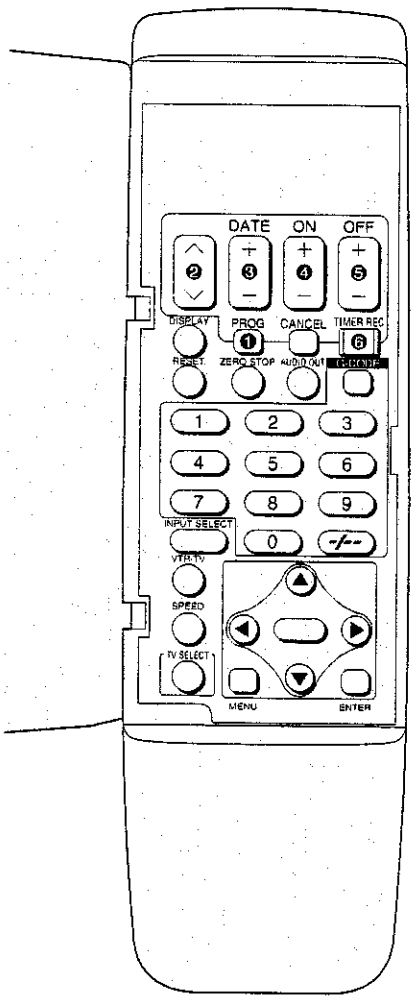


- Press **STOP** to release from Repeat Playback mode.

To return to a Specified Scene

1 Press **RESET** to set the counter to 0:00.00.

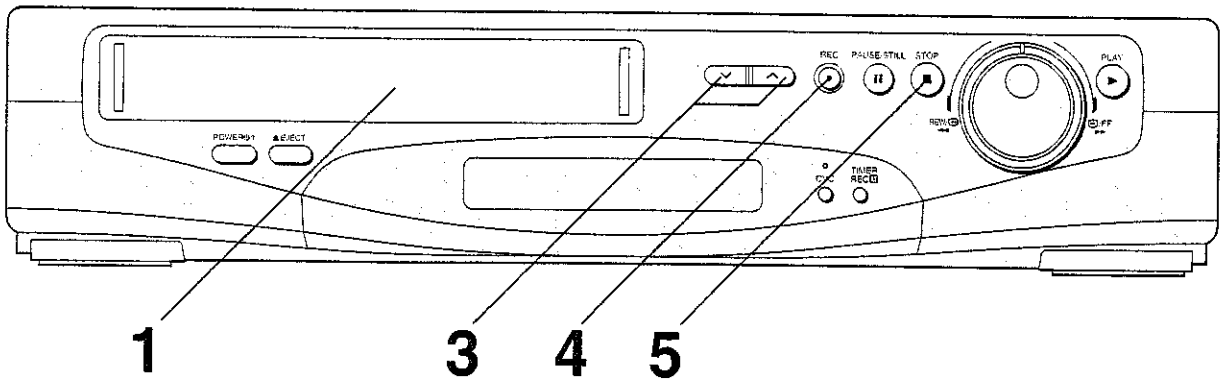
2 After playback, press **ZERO STOP** in the stop mode.
- The tape will be rewound or fast forwarded to 0:00.00 approximately.

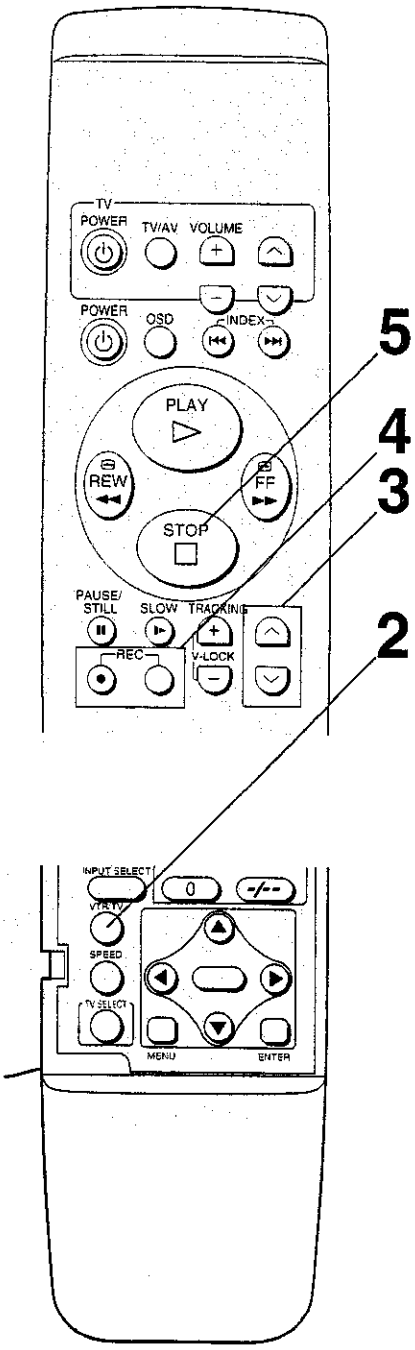


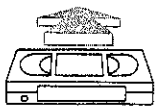
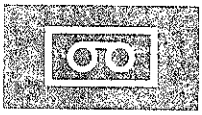
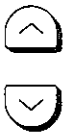
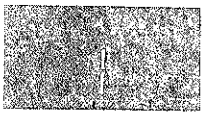
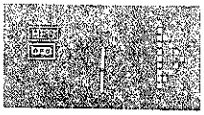
Notes:

- Audio reproduction of linear (conventionally recorded) tapes will be monaural when played back on the FM Hi-Fi video recorders.
- Cue, review or slow playback will be automatically released after 10 minutes, and still playback after 5 minutes.
- In LP mode only:
  1. During any playback mode other than normal playback, the picture may have some noise bars, the colour may be unstable, or a black and white picture may appear.
  2. When playing back a tape which was recorded on another VTR, it may be necessary to adjust the Tracking Control. In some cases the picture quality may still be inferior. This is due to limitation of format.

Manual Recording

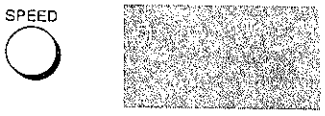




Operations	Display Symbols	
1 		Insert a cassette tape. ●If it has already been inserted, press **POWER** to turn the VTR on.
2 VTR/TV		Select the VTR mode. (NV-HD650EA only)
3 		Select TV station.
4 REC		Start recording.
5 STOP		Stop recording.

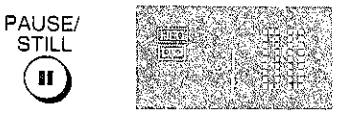
To select the Desired Tape Speed

Press **SPEED** before recording.



To interrupt Recording

Press **PAUSE/STILL** during recording.
Press again to continue recording.



To record One TV Programme while Viewing Another Programme

1 Refer to the manual recording operations steps **1** to **4**.

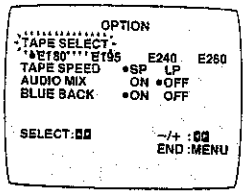
2 Press **VTR/TV** to select the TV mode. (NV-HD650EA only)

3 Select the TV programme on your TV set you wish to view at the present time.

To display the Approximate Remaining Tape Time

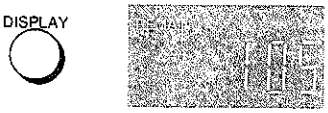
1 Select **TAPE SELECT** on **OPTION** on screen display and select the corresponding cassette tape length. See page 18.

On Screen Display



E180: For E30, -60, -90, -120, -150 and -180 tapes
E195: For E195 tape
E240: For E240 tape
E260: For E260 and -300 tapes

2 Press **DISPLAY**.

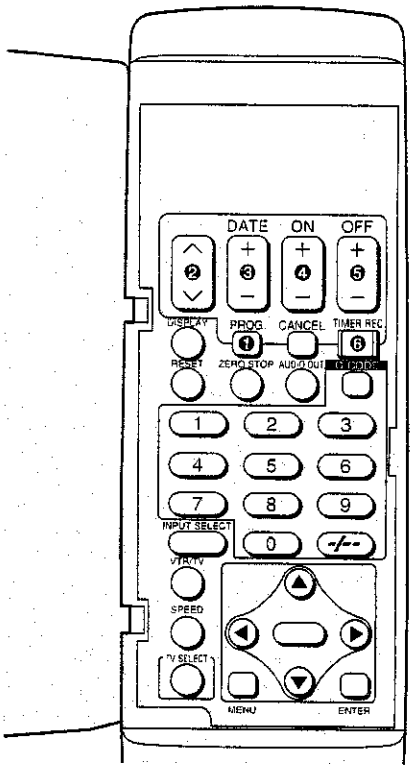


→Clock→Counter→**Remaining Tape Time**

- The remaining tape time may not be displayed correctly depending on the tape used.

Notes:

- When a video cassette with a broken off tab is inserted, the "⊙⊙" indication will flash to indicate that recording is not possible.
- The recording pause mode will be automatically released after 5 minutes. Revert back to the stop mode.



The NICAM Broadcast System (NV-HD650EA only)

NV-HD650EA is equipped with the NICAM sound system. NICAM is a 2 channel sound broadcast system to provide either a high quality stereo sound track or 2 independent MONO sound tracks, M1 and M2.
NICAM programmes are always accompanied by standard sound broadcasts and you can select the desired sound with **AUDIO OUT** during playback.

- The NICAM digital stereo sound can only be recorded on the Hi-Fi audio track.
- When NICAM programme is being received, the indicators are lit to inform you of the type of broadcast. (See page 30.)
- To record the regular sound (ordinary normal sound) on the FM audio tracks when a NICAM programme is received, select **MONAURAL ON**. (See page 19.)
- To hear stereo performance connect as shown on page 8 to a TV or Stereo Amplifier with left and right audio inputs.

Important Note for the NICAM System

When NV-HD650EA is switched on, the tuner will automatically switch to a NICAM broadcast, if NICAM is being transmitted.
At this time the NICAM signal is transmitted on stereo channels only, since the M1 and M2 formats are not yet available. Even if the sound track is in MONO, the stereo indicator will appear.

Timer Recording

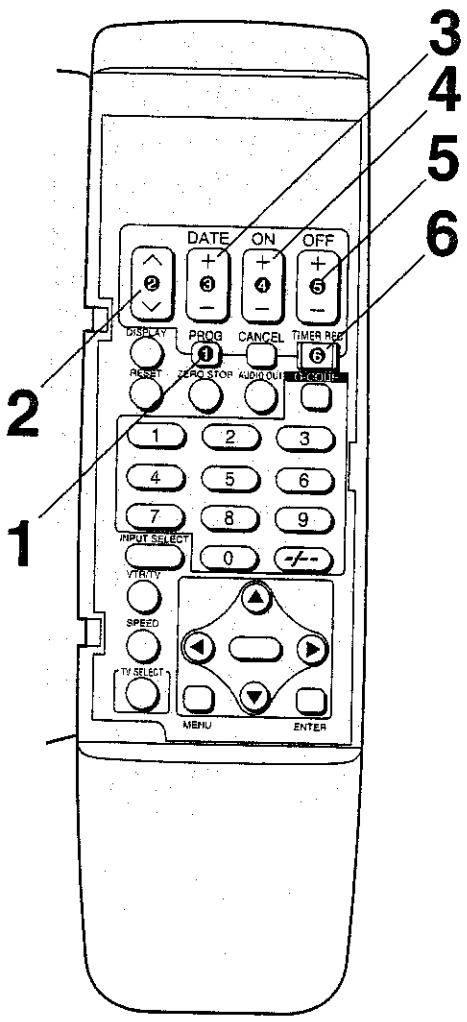
Up to 8 timer programmes can be recorded up to one month in advance by setting the timer, including weekly and daily programmes.

Preparations

- Insert a cassette tape with an intact erasure prevention tab.
- Confirm that the TV is on and the VTR viewing channel is selected.
- Turn on the VTR.
- Press **VTR/TV** to select the VTR mode. (NV-HD650EA only)

For Example:

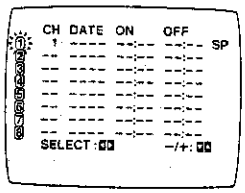
Timer programme number; 1
Programme position (channel); 2
Date; 27th, October
Starting time; 20:02
Ending time; 21:30
(Present date; 16th, October)



Operations — On Screen Display

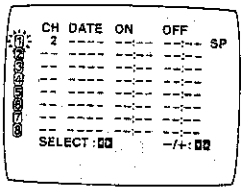
1 Select **Timer Programme number** "1".

PROG ❶



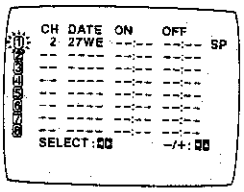
2 Set **Programme position** (channel) "2".

❷



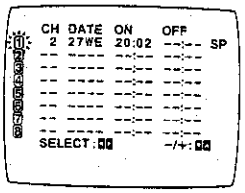
3 Set **Date** "27".

DATE + ❸ −



4 Set **Starting time** "20:02".

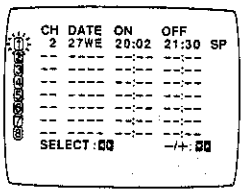
ON + ❹ −



- When it is kept pressed, the indication changes in 30-minute steps.

5 Set **Ending time** "21:30".

OFF + ❺ −



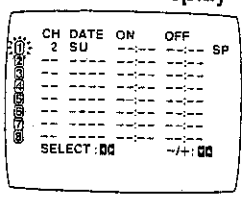
6 To activate timer recording, press **TIMER REC**.

TIMER REC ❻

Weekly Timer Recording

In step **3**, select the desired day by pressing **DATE –**.
For example, SU (Sunday)

On Screen Display



(SU=Sunday, MO=Monday, TU=Tuesday, WE=Wednesday, TH=Thursday, FR=Friday, SA=Saturday)

Daily Timer Recording

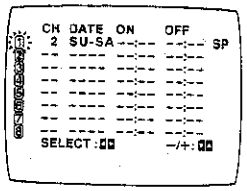
For this timer function, several groups of days can be selected.

Ⓐ Daily recording from Monday to Friday

Ⓑ Daily recording from Monday to Saturday

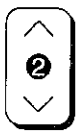
Ⓒ Daily recording from Sunday to Saturday

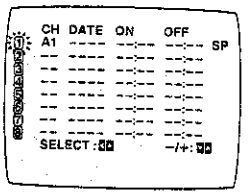
In step **3**, select the desired days by pressing **DATE –**.
For example, Ⓒ



Timer Recording from External Signal Source

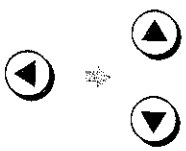
If Timer Recording is performed by a unit connected to the Audio/Video input sockets (AV1/AV2), select the A1 or A2 indicator in step **2** for the programme position.

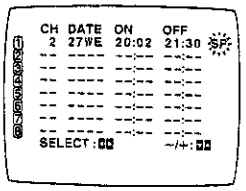




Selecting the Desired Tape Speed

Press ◄ and then select the desired tape speed by pressing ▲ or ▼ in any of steps **2–5**.





Setting other Programmes in succession

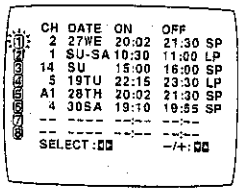
Repeat steps **1–5**.

Checking a Timer Programme

- The VTR must be turned on, or the timer recording indicator "◷" is lit.
- Confirm that the TV is on and the VTR viewing channel is selected.

1 Press **PROG**.

PROG



2 Press **VTR/TV** to select the VTR mode. (NV-HD650EA only)

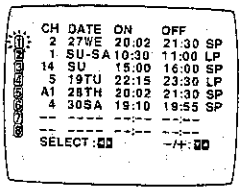
VTR/TV

Cancelling a Timer Programme

- The VTR must be turned on, or the timer recording indicator "◷" is lit.
- Confirm that the TV is on and the VTR viewing channel is selected.

1 Press **PROG**.

PROG

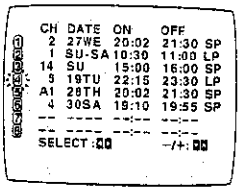


2 Press **VTR/TV** to select the VTR mode. (NV-HD650EA only)

VTR/TV

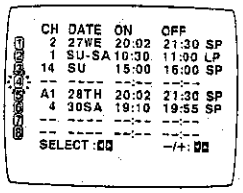
3 Press **PROG** repeatedly until the desired timer programme number is flashed on and off.

PROG



4 Press **CANCEL**.

CANCEL



Note:

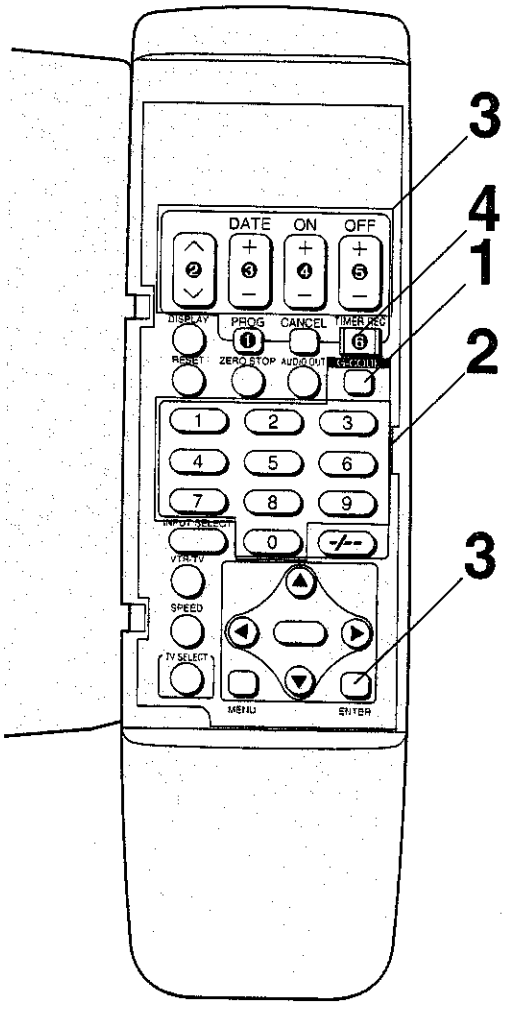
If a timer recording is not performed to the end (due to insufficient tape or cancellation by the user), the programmed timer recording data will be cancelled from the memory by 4 a.m. one day later.
However, if the Timer Record Function is activated at that time, the programmed timer recording data will be cancelled at 4 a.m. the next day.

G-Code Programming

Programming is now easier than ever: simply enter the G-Code number provided in the programme schedule column carried by newspapers and magazines.
G-Code numbers are numbers which are assigned to each programme listed in the TV programme schedule carried in newspapers and TV guides. When these numbers are entered, the numbers are converted into the actual programming.

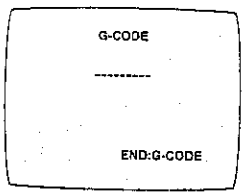
Preparations

- Insert a cassette tape with an intact erasure prevention tab.
- Confirm that the TV is on and the VTR viewing channel is selected.
- Turn on the VTR.
- Press **VTR/TV** to select the VTR mode. (NV-HD650EA only)

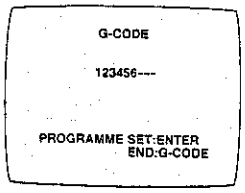


Operations	On Screen Display

1 Press **G-CODE**.

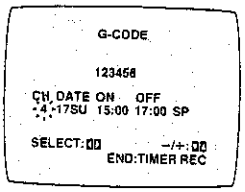


2 Enter a G-Code number.
Example: 123456

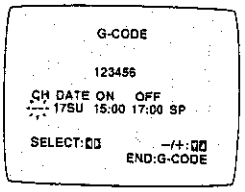


- If you have entered the wrong number, press **CANCEL** and then enter the proper number.

3 Press **ENTER**.



- Confirm that the number corresponds to the right programme. If the display looks like this:



select the programme position of your VTR which receives the TV station you entered at step **2** using button ❷ and then press **ENTER**.

- To make any corrections, use buttons ❸–❺ as the same way on page 24.

4 Press **TIMER REC**.

Notes:

- To select the desired tape speed, press **SPEED** before programming.
- When the G-Code number is used for programming, the recording time may be slightly longer than the actual programme time.
- Repeat steps **2** and **3** if "PROGRAMME IS INCOMPLETE." appears.
- When programming two or more programmes, repeat steps **1–3** before pressing **TIMER REC**.
- The procedures for checking and cancelling a timer programme are the same as on page 25.

Editing

Assembly Editing

This function can be used to make up an edited tape from other recordings or video sources.

A new scene can be added to the end of a previous one.

Preparations

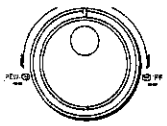
- Connect a movie camera or another VTR to this VTR as shown.
- Insert a recorded cassette tape with an intact erasure prevention tab.
- Select the video source required by pressing **INPUT SELECT** to set A1 or A2.
  - A1: Through the AV1 (AUDIO IN/VIDEO IN) sockets.
  - A2: Through the AV2 (AUDIO IN/VIDEO IN) sockets on front panel.
- Set **NTSC SELECT**.
  - NTSC P.B.: When recording in the PAL system.
  - 4.43: When recording NTSC 4.43 signals from External Signal Source.

When dubbing an NTSC tape, keep the **NTSC SELECT** on both the recording and playback units at the **4.43** position.

Operations

1 Press **PAUSE/STILL** on the recording VTR.

2 Search for the end of the previous recording.

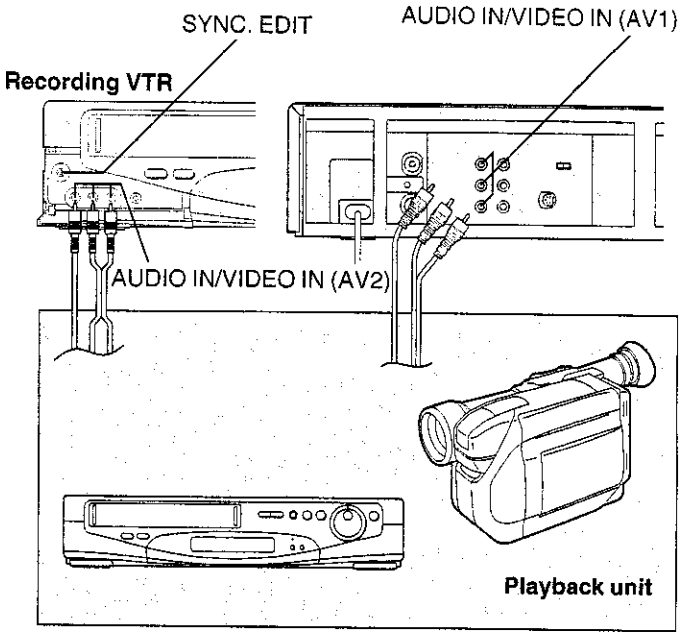


3 Press **REC** to switch the VTR from the pause mode to the recording standby mode.

4 Start the new recording by pressing **PAUSE/STILL** again.

5 Press **STOP** to stop recording.

Note:
The new sound will be recorded on both the normal and Hi-Fi sound tracks, only monaural sound recording is possible on the normal sound tracks.



Synchronized Editing

It is possible to synchronize the playback start and stop of the Movie Camera with the recording start and stop of this VTR.

Preparation
Connect a Movie Camera to this VTR with Synchro Connection Cord (VW-K1E).

1 Put the VTR in the recording pause mode by pressing **PAUSE/STILL** (VTR) and **REC**.

2 Put the Movie Camera in the still playback mode at the point where you want to start editing.

3 Press **PAUSE/STILL** on the VTR.
- The Movie Camera changes over to the playback mode and the dubbing will start automatically.

Synchronized Editing between the VTRs
When editing from another VTR equipped with Synchro Edit Socket, synchronized start and stop of both VTRs can be activated from this VTR.

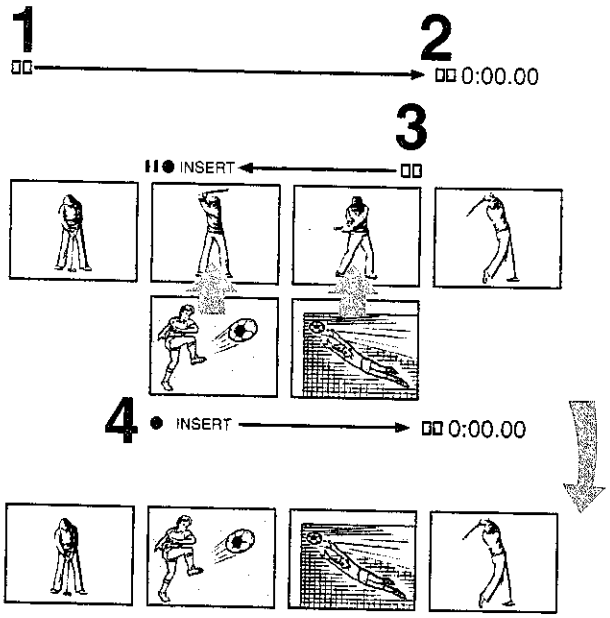
The operation is the same as described for synchronized editing from a Movie Camera.

Insert Editing

This is used to substitute one scene for another providing.

Preparations

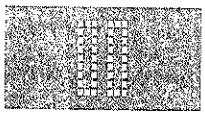
- Insert a recorded cassette with an intact erasure prevention tab.
- Select the video source required by pressing **INPUT SELECT** to set A1 or A2.
  - A1: Through the AV1 (AUDIO IN/VIDEO IN) sockets.
  - A2: Through the AV2 (AUDIO IN/VIDEO IN) sockets on front panel.



Operations

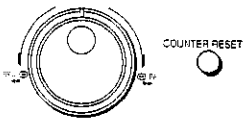
Display Symbols

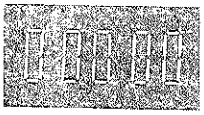
1



Press **PAUSE/STILL** on recording the VTR.

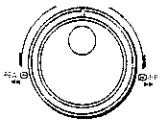
2



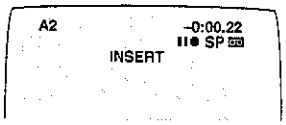


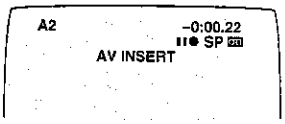
Search for the Edit out (ending) point, and set the counter to 0:00.00 by pressing **COUNTER RESET**.

3



On Screen Display

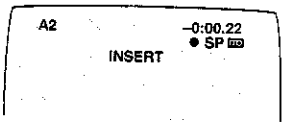


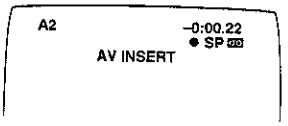


Search for the Edit in (starting) point, and press **INSERT**.

- If you want to replace the sound on the "normal" audio track, press **AUDIO DUB**, too. (AV Insert Editing)

4





Start insert editing by pressing **PAUSE/STILL**.

- The insert editing will finish when the counter reaches 0:00.00.

Note:

Insert Editing cannot be used on blank sections of a tape. In this case use Assembly Editing first.

The new sound will be recorded on the Hi-Fi sound track. If AUDIO DUB selected, the new sound will also be recorded on the normal sound track.

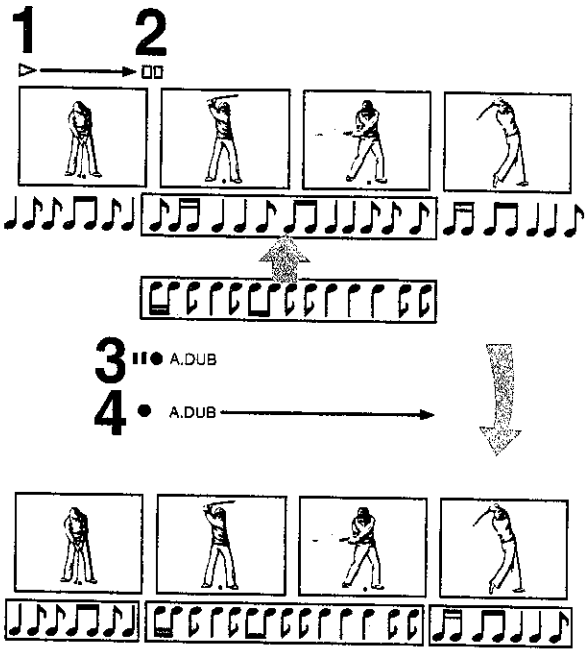
Only monaural sound recording is possible on the normal sound tracks.

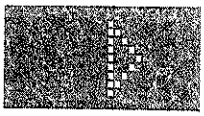
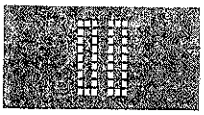
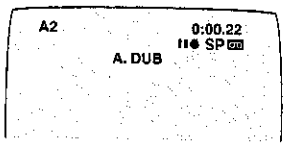
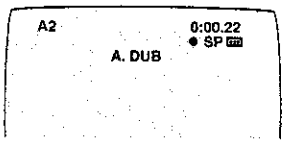
Audio Dubbing

The audio dubbing is made on the normal audio track and erases the original sound on this track. On Hi-Fi audio tracks, however, the original sound is maintained.

Preparations

- Insert a recorded cassette with an intact erasure prevention tab.
- Select the video source required by pressing **INPUT SELECT** to set A1 or A2.
  A1: Through the AV1 (AUDIO IN) sockets.
  A2: Through the AV2 (AUDIO IN) sockets on front panel.



Operations		Display Symbols	
1	PLAY		Search for the starting point for audio dubbing.
2	PAUSE/STILL		Press **PAUSE/STILL** at the starting point.
3	AUDIO DUB	On Screen Display 	Set for audio dubbing by pressing **AUDIO DUB**. • On some televisions, the screen image may become unstable or begin to scroll at this point. However, this is not an indication of a malfunction.
4	PAUSE/STILL		Start recording the new sound by pressing **PAUSE/STILL**. • Stop recording by pressing **STOP**.

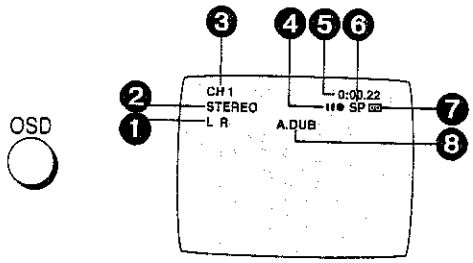
Note:
The new sound will be recorded on the normal sound track of the tape, and the original sound will remain on the Hi-Fi sound track. Only monaural sound recording is possible on the normal sound track.

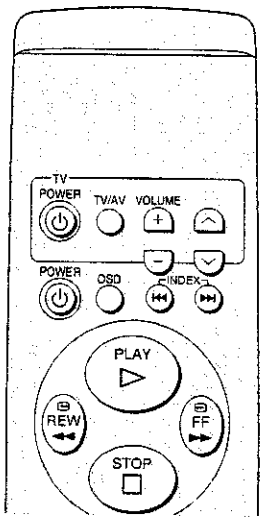
To hear the new sound, select the normal sound track by pressing **AUDIO OUT**.
To hear the new sound and original sound mixed together, set **Audio MIX** to ON. (See page 19.)

Other Functions

On Screen Display

Press **OSD** to make the On Screen Display appear on the TV screen.
- To make this display disappear, press **OSD** again.





❶ Audio Output Mode Indicators
The Left (L) and Right (R) Indicators show which sound mode is selected with **AUDIO OUT**.

Stereo: Both the Left (L) and Right (R) Indicators appear.
Left: The Left (L) Indicator appears.
Right: The Right (R) Indicator appears.
Normal: Both the Left (L) and Right (R) Indicators don't appear.

❷ STEREO or BILINGUAL Indicator (NV-HD650A)
When receiving a TV programme, the type of sound system in which it is broadcast is automatically indicated.

STEREO, M1 and M2 Indicator (NV-HD650EA)
When receiving a TV programme with the NICAM sound system, the type of sound system in which it is broadcast is automatically indicated.
STEREO: When receiving a NICAM stereo broadcast.
M1 M2: When receiving a NICAM dual-sound broadcast.
M1: When receiving a NICAM monaural broadcast.

Note:
To hear stereo performance connect as shown on page 8 to a TV or Stereo Amplifier with left and right audio inputs.

❸ Programme position

❹ Tape running display

Stop, Eject	
Rewind, Review	◀◀
Fast Forward, Cue	▶▶
Playback	▶
Still Playback	❚❚
Recording	●
Recording Pause	❚❚●
Slow Playback	❚▶

❺ Present time/Tape counter

Information	Display
Present time	17:24
Tape counter	−2:35.47
Remaining Tape Time	REMAIN 2:34
Dew	DEW
Index search	S 01

❻ Tape speed indicator

❼ Cassette-in indicator

❽ Edit mode
When edit mode (Insert Editing, AV Insert Editing, Audio Dubbing) is set, the On Screen Display appears.
INSERT: Insert Editing
AV INSERT: AV Insert Editing
A.DUB: Audio Dubbing

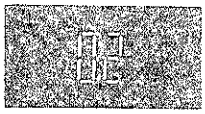
Note:
On Screen Display may be disturbed or disappear during special playback.

VHS Index Search System

It is very easy to find the beginning of each recording, because a special index signal is recorded at the start of each recorded segment on the tape.

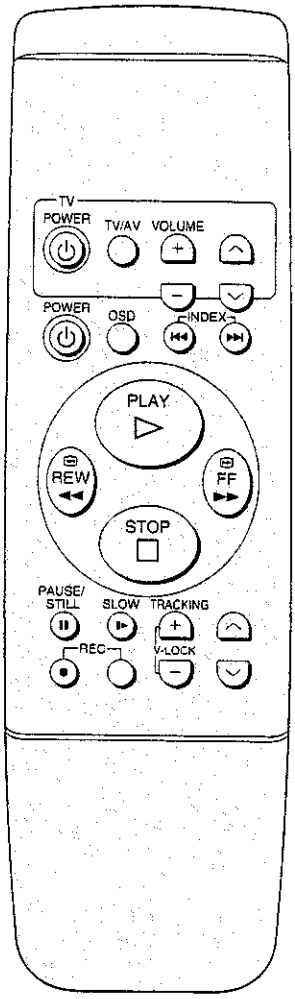
For example:
Searching for the 2nd recorded segment in the forward direction.

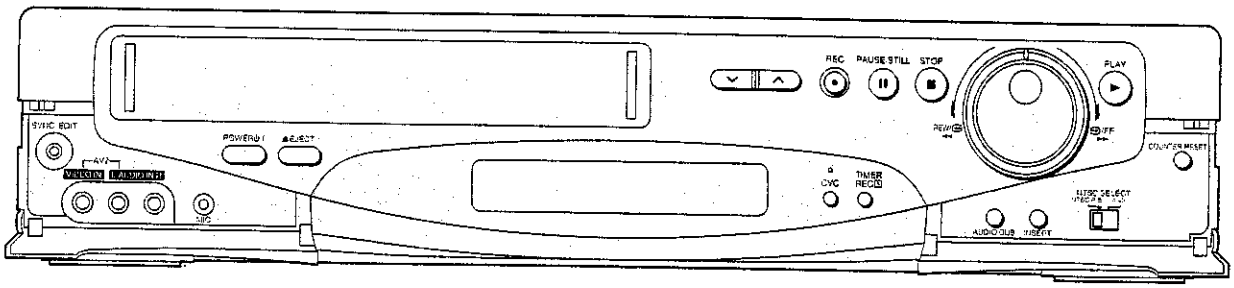
Press **INDEX ⏭** twice.



- After finding the specific recorded segment, playback starts automatically.
- For the reverse direction, press **INDEX ⏮**.
- Up to 20 index signals can be searched for in both directions.
- When the opposite **INDEX** button is pressed, the number shall be decreased till 1.
- The figure on the display is decremented by 1 each time an index signal is located.
- The INDEX search function can only work correctly, if the index signals are spaced at least 3 minutes apart in the SP mode and 5 minutes apart in the LP mode.

Recording Index Signals
Index signals are recorded in following cases.
- When a recording is started by pressing **REC**.
- When **REC** is pressed during recording.
- When timer recording is activated.





NTSC Playback

Tapes recorded in the NTSC system can be played back with this VTR via a PAL system TV set.

- Set **NTSC SELECT** according to the colour TV system of the TV set.

  NTSC P.B.: For TV's that can only receive PAL signals.
  4.43: For TV's that can receive NTSC 4.43 signals.

A note about NTSC playback on PAL TV

On some TVs, the playback picture may roll up or down: adjust this using the V-HOLD control on the TV. TVs not equipped with a V-HOLD control cannot correct this condition. The playback picture will shrink vertically, and black bars will appear both on the top and bottom of the screen. This is not an indication of a malfunction.

- During Cue, Review, Still or Slow playback, the picture may not be in colour.
- This function is designed only to allow the playback of tapes recorded by NTSC signals on a PAL system TV. The NTSC signal is not completely converted to a PAL signal. For this reason, images played back by this function cannot be recorded on another VTR.

Other Automatic Functions

Automatic playback

When a cassette without an erasure prevention tab is inserted, the VTR starts playback automatically.

VTR-off playback

When the VTR is off, an inserted cassette can be played back by pressing **PLAY**.

Automatic rewinding

When the tape reaches its end during recording (except for timer recording) or playback, it will automatically be rewound to the beginning.

Automatic switching off and ejection

When the VTR is switched off, an inserted cassette can be ejected simply by pressing **EJECT**. The VTR will eject the cassette and automatically turn itself off again.

S-VHS Quasi Playback (SQPB)

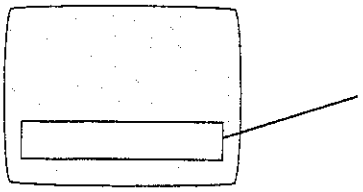
It is also possible to playback tapes recorded in the S-VHS system.

- Some picture noise may occur depending on the type of tape used.
- It is not possible to fully obtain the high resolution that S-VHS is capable of.
- It is not possible to record in the S-VHS system with this VTR.

Before Requesting Service

Before requesting service, check the following points once again.

Message of On Screen Display



MESSAGE	CAUSE	REMEDY
PLEASE PUT IN A VIDEO CASSETTE.	**REC** is pressed without cassette.	Put in a video cassette.
PLEASE STOP THE TAPE.	**TUNER PRESET** is selected during playback.	Stop the tape.
PLEASE SET THE CLOCK.	**PROG** is pressed when the clock is not set.	Set the clock.
PLEASE USE A CASSETTE WITH TAB.	**REC** is pressed without tab of Cassette.	Use a cassette with tab.
NO TIMER RECORDING HAS BEEN SET.	**TIMER REC** is pressed with no timer programmes.	Set timer recording.
TIMER PROGRAMMES ARE FULL.	**G-CODE** is pressed when 8 programmes have been already set.	Cancel unneccessary programme.
VTR IS IN THE TIMER STANDBY MODE.	**POWER** is pressed during timer standby mode.	Press **TIMER REC** to release from timer standby mode.
DEW FORMED IN THE VTR.	Dew forms.	Wait until the message disappears.

Self Test Indication

This VTR has a self-diagnosis and display function. If the VTR detects trouble during installation or during use, the following indications automatically appear in the VTR display. Indications are displayed in the form of a single English letter plus two numbers such as [H01].

INDICATION	CAUSE	REMEDY
U 1 0	Dew forms.	Wait until the indication disappears.
H□□	Some trouble has occurred. (Numbers following H and F differ according to the status of the VTR.)	Consult your dealer for further advice.
F□□		

VTR will not operate correctly

SYMPTOM	CAUSE	REMEDY	CHECKED
VTR display is not illuminated.	Mains lead is not connected.	Reconnect mains lead to VTR.	
VTR display is illuminated but VTR will not operate.	VTR is in timer mode.	Press **TIMER REC** to operate VTR manually.	
	Safety devices are operating.	Disconnect mains lead and wait for 1 minute. Reconnect mains supply and check functions.	
	Condensation may have formed.	Do not operate VTR for 1 hour.	
A language which you do not understand appears on the TV screen.	The Language Setting is set to a language which you do not understand.	Select the desired language. See page 12.	

Playback will not operate correctly

SYMPTOM	CAUSE	REMEDY	CHECKED
Picture noisy or not in colour. Horizontal bars or lines run down the screen.	Tracking is not correct.	Adjust the tracking. See page 6.	
	TV set is not tuned to VTR.	Operate **TEST SIGNAL** on VTR and check TV tuning. See page 9. (NV-HD650A) Operate **Video Playback Channel Selector** on VTR and check TV tuning. See page 10. (NV-HD650EA)	
	Video heads are clogged or worn.	Consult your dealer for further advice.	

Recording will not operate correctly			
SYMPTOM	**CAUSE**	**REMEDY**	**CHECKED**
"⊙⊙" indication flashes whenever recording is attempted.	Erasure prevention tab on cassette is broken off.	Use tape with intact erasure prevention tab, or cover tab hole with adhesive tape, if original recording is no longer required.	
Picture is recorded with noise or blank screen.	Aerial or aerial lead is defective.	Check aerial connection to VTR. See page 8. Check your normal TV picture. If there is no picture, check your aerial.	
	VTR is not correctly tuned.	Re-tune VTR. See page 14.	
	A1 or A2 is selected.	Select the required TV programme.	
Timer recording cannot be performed.	Clock or calendar is incorrectly set.	Check clock and calendar. Set to present time. (Note this is a 24 hour clock.) See page 13.	
	Recording start or end time setting is incorrect.	Set recording start and end time correctly.	
	VTR is not set for timer recording.	Press **TIMER REC** after programming for timer recording.	
AV external recordings cannot be made.	A1 or A2 is not selected.	Select A1 or A2 by pressing **INPUT SELECT**.	
	External AV connections are incorrect.	Check that connections for external video and audio source are correct. See page 27.	

Remote controller will not work correctly			
SYMPTOM	**CAUSE**	**REMEDY**	**CHECKED**
Remote controller does not operate correctly.	Remote controller transmitter beam is not reaching VTR.	Ensure that remote controller is being pointed at VTR and that transmitter beam is not obstructed.	
	Distance is too far.	Use remote controller within 7 m of VTR. If this range is not possible, replace batteries.	
	Batteries are exhausted.	Replace batteries. Note precaution for replacement on page 7.	
	Batteries are incorrectly fitted with (+/−) reversed.	Fit batteries correctly as shown on page 7.	

Precautions

Please read these cautions before you operate this VTR.

Avoid Sudden Changes in Temperature

If the VTR is suddenly moved from a cold place to a warm place, condensation may form on the tape and inside the VTR. In this case, the Dew Indicator "d" will flash on and off and the VTR will not operate.

Humidity and Dust

Avoid places where there is high humidity or much dust, which may cause damage to internal parts.

Do Not Obstruct the Ventilation Holes

The ventilation holes prevent abnormal increase in temperature. Do not block or cover these holes. Especially avoid covering the holes with soft materials such as cloth or paper.

Keep away from High Temperature

Keep the VTR away from extreme direct heat such as direct sunlight, heating radiators, or closed automobiles.

Keep Magnets away

Never bring a magnet or magnetized object near the VTR because it will adversely affect the performance of the VTR.

No Fingers or Other Objects Inside

Touching internal parts of this VTR is dangerous, and may cause serious damage to the VTR. Do not attempt to disassemble the VTR. There are no user serviceable parts inside.

Keep Water away

Keep the VTR away from flower vases, tubs, sinks, etc.
CAUTION: If liquids are spilled into the VTR, serious damage could occur. If you spill any liquid into the VTR, consult qualified service personnel.

Lightning

To avoid damage by lightning, disconnect the aerial plug from the VTR.

Cleaning the VTR

Wipe the VTR with a clean, dry cloth. Never use cleaning fluid, or other chemicals. And do not use compressed air to remove dust.

Stacking

Place the VTR in a horizontal position, and do not place anything heavy on it.

Video Head Clogging

The video heads place picture signals on the tape during recording and read picture signals from the tape during playback and they are, therefore, of critical importance for the picture quality. If the VTR is used over extremely long periods of time, these heads may become dirty and clogged. In such a case, the signals can no longer be recorded correctly, and the playback picture will be distorted accordingly. This is the case, for example, during the playback of a tape, the sound is reproduced normally, but no picture is seen, or the picture is greatly distorted. When such a symptom case occurs have the recorder checked by qualified service personnel.

Head cleaning by service agent is not covered by warranty.

If Dew Condensation Forms in the VTR

Condensation may form in the VTR if:

- The VTR is in a room where the heater has just been turned on.
- The VTR is in a room with steam or high humidity.
- The VTR is brought from cold surroundings into a well-heated room.
- The VTR is suddenly brought from cool surroundings, such as an air-conditioned room or car, to a place which is hot and humid.

When dew forms in the VTR, the Dew Indicator "d" on the display will flash on and off and all the function buttons are made non-operational to protect the tape and the video heads. When the Dew Indicator flashes, wait until this indicator disappears.

- If dew condensation forms inside the VTR while the VTR is off, it will turn on automatically and the Dew Indicator will flash on and off. As soon as the dew condensation has been dissolved, the VTR will turn itself off again.

Specifications

NV-HD650A/EA

Power Source:	240 V AC 50–60 Hz (NV-HD650A) 230 V AC 50–60 Hz (NV-HD650EA)	
Power Consumption:	23 watts	
Video Recording System:	2 rotary heads, helical scanning system	
Video Heads:	4 heads	
Tape Speed:	SP; 23.39 mm/sec. LP; 11.7 mm/sec.	
Tape Format:	VHS tape	
Record/Playback Time:	SP; 240 min. with NV-E240 LP; 480 min. with NV-E240	
VIDEO		
Television System:	CCIR; 625 lines, 50 fields, PAL colour signal	
Modulation System:	Luminance; FM azimuth recording Colour signal; converted subcarrier phase shift recording	
Input Level:	VIDEO IN (PHONO); 1.0 Vp-p,	75 ohm, terminated
Output Level:	VIDEO OUT (PHONO); 1.0 Vp-p,	75 ohm, terminated
	RF Modulated; UHF channel AU37±6 (NV-HD650A),	75 ohm
	VHF channel NZ2 or 3 (NV-HD650EA),	75 ohm
AUDIO		
Input Level:	AUDIO IN (PHONO); −10 dBV,	more than 47 kohm
	MICROPHONE (M3); −70 dBV	
Output Level:	AUDIO OUT (PHONO); −8 dBV,	less than 1 kohm
Audio Track:	1 track (Normal-mono only), 2 channels (Hi-Fi sound-stereo)	
Video Horizontal Resolution:	Colour; more than 240 lines (SP)	
Dynamic Range:	Audio; more than 90 dB (Hi-Fi audio track)	
Audio Frequency Response:	20 Hz–20 kHz	
Wow and Flutter:	0.005% Wrms/Hi-Fi	
Operating Temperature:	5°C–40°C	
Operating Humidity:	35%–80%	
Weight:	4.6 kg	
Dimensions:	430 (W)×91 (H)×312 (D) mm	
Standard Accessories:	1 pc. RF Coaxial Cable 1 pc. Remote Controller 2 pcs. "R6" size batteries 1 pc. AC Mains Lead 1 pc. Audio Cable	

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.